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AND

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THE

FOOD JOURNAL.

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RAISONS D'ÊTRE.

The usual reasons for starting a new periodical may be given with tenfold truth in the present case. Food and health are necessaries with which none of us can dispense, though, unfortunately, many of us possess them in a sadly limited sense. Those who enjoy health do not value it as they ought, nor do they endeavour to economise their resources; but, like children, toss them about in reckless waste, until, with age, comes wisdom, and they set themselves sadly and earnestly to regain what they have lost. So with our food. Because dinner makes its appearance on our table with time-honoured regularity, we think little of it, although we are ready enough to grumble heartily if circumstances entail our going without it for a single day. But how many there are who seldom, if ever, see dinner at all. In many parts of England, labourers think themselves lucky if they get meat once a week, while thousands think themselves luckier still if they see their way to a meal of bread once a day.

If it be true, as statisticians tell us, that the whole population of this country only obtains an average weekly allowance of three and a half pounds of meat per head, while the working man in the colonies has ten pounds or more, nobody can deny that the question of food for the masses is one of the most important of the day, and one that ought to be thoroughly and systematically enquired into. From every point of view,—social, humanitarian, sanitary, financial,—there are cogent reasons for doing so. Look at the difference between society well fed, sleek and contented, and society hungry, gaunt and wolfish. When a people has plenty to eat, the stump orator's occupation is gone; and we hold that it is an integral part of the duty of a Government to direct some of its energies to these points, as well as to Reform Bills and Church matters.

Even from a personal and selfish view, the food question is not to be sneered at. We are notoriously the worst and the most wasteful cooks in Europe, and yet we prefer jogging on in the same course of continuous indigestion, rather than alter our ways. Napoleon is said to have lost the battle of Leipsic through error of judgment, induced by a tough mutton chop; and, if the whole truth was known, it is more than probable that many great results have arisen from analogous causes. At all events, we know in our own persons how inattention to diet disorganises us mentally and physically, and renders us miserable, splenetic dyspeptics, instead of even-tempered, well-regulated citizens.

In this journal, therefore, we propose to treat of food in every possible aspect and variety, and particularly in its national bearings; such as economising our present resources, and obtaining new ones. One of our most prominent features will be the question of adulteration, all the more important to the public because it is so difficult to detect, and almost impossible to avoid. Nearly everything that we eat and drink is the subject of it; and it is not too much to say that the nation is undergoing a process of slow poisoning, plainly visible in the deterioration of physique and the increase of disease. To further our object, analyses will be regularly made of the various articles of common use from different parts of the kingdom, so that, at all events, if our readers insist upon eating their "peck of dirt," they may know when they are going to eat it.

We propose too to treat *in extenso* of those great questions of public health which are now, happily, attracting so much attention; of the water supply of our towns; the pollution of our rivers; the drainage and ventilation of our houses; the over-crowding of our population; and the various acts of legislation affecting our moral and physical condition; while to increase the value of English facts and statistics, we hope to place by their side those of other countries, and thus gradually accumulate a record of the greatest importance, which will free us from the reproach that "the one half of the world does not know how the other half lives."

THE MEAT QUESTION OF 1870.

I DO not propose in this article to enter into any disquisition on the necessity of a good supply of animal food to all classes in the kingdom, be they princes or peasants; but to take it for granted that such a necessity exists. Whatever may be the causes of the difficulty of obtaining meat at a reasonable price, everybody must welcome the efforts which are being made in various quarters to introduce into England beef and mutton from other countries, which, if it will not rival our own in quality, may at all events serve as a substitute for it. A great deal has been done within the last year or two, and though the question has only been partially solved as yet, and many hindrances and unforeseen accidents have arisen, there is on both sides of the hemisphere a large body of earnest men, determined that, ere long, the bountiful supplies which providence has placed in one part of the globe shall find their proper use in ministering to the necessities of the poor hungry creatures in the other.

Nor is this a question of philanthropy merely, but of the deepest commercial importance to our colonies, which revel in the very kind of riches that we so much want; their aim is to get rid of them, ours to receive them. The squatters in Australia possess in ordinary times such incredible numbers of sheep that they really do not know what to do with them, and for want of a market they are forced to boil them down for their tallow. Now a sheep of an average weight of 50 lbs., when boiled down, produces about 23 lbs. of tallow, which, when sold in London, after paying all costs of boiling, casks, etc., yield something like 5*s*. 6*d*. a head per each sheep. The drought of the Australian summer of 1868-9 played such cruel havoc with the flocks from the scarcity of keep, that there has not been anything like the usual glut in the squatters market, and consequently the supplies sent to England during the past year have been on a comparatively small scale.

Let us see what are the various processes by which colonial supplies are sent or proposed to be sent to this country. They may be divided into six: 1, that of extract; 2, tinning; 3, curing; 4, chemical preparations; 5, freezing; 6, transportation of live cattle. By chemical preparations, we mean the application of special compositions intended to serve as antiseptics; for, speaking broadly, all the first four processes come within the domains of chemistry, even the old-fashioned salting depending upon it for its effect. To

this list might be added the "dried" meats, which at one time came over from South America in considerable quantities under the name of "charqui," and which consisted of flesh stripped from the bone, allowed to cool, and afterwards cut into thin slices with layers of salt. But the charqui which was brought to England contained fat, which it ought not to have, and was thereby rendered so unappetising, that its popularity in this country was very shortlived.

Everybody is familiar with the *extractum carnis*, which, whether Liebig's, Tooth's, "Ramornie" or Whitehead's, has become such a favourite with invalids, or indeed with all households, from the extreme readiness with which good soup is prepared. The principal seat of the Liebig manufacture is at Fray Bentos, on the Uruguay, where the premises are on a gigantic scale, allowing for the cutting up of 200 bullocks an hour. But though extracts are useful in more ways than one, and have an enormous sale in England, they can scarcely be called meat supplies in the proper sense of the word, and certainly are not in common use with the working classes.

As far as the principle goes, tinned and cured meats are very much the same thing, both depending on exclusion of air and requiring a partial or absolute cooking. If exclusion of air alone would prevent decomposition it would be easy to send over raw joints in exhausted receivers, but even that is not sufficient, for the air must be entirely driven out from the tissues, the only way of doing this being to cook it first. Curing differs from tinning principally from its being performed on a larger scale, whole joints or even carcases being operated on at once, instead of a few pounds at a time.

The tinning of meat has already developed an enormous trade between Australia and Great Britain, and there is scarcely a county in the various colonies that does not possess some sort of meat-preserving establishment, principally from the fact that it does not necessitate an expensive plant to start with. Nevertheless, there have been many failures and much loss of money, for, simple as the process looks, it is one of so much nicety of detail, that an expert is required to conduct it properly. Briefly, tinning consists in partially cooking the meat and packing it in air-tight tins, which are placed in a bath, subjected to a temperature varying from 200° to 300° Fahr., and then hermetically sealed. There are several different methods of tinning, though they only differ in detail, such as the temperature and composition of the bath. The Melbourne Preserving Company, for instance, use one of muriate of lime, which is capable of being heated to 300°. On the surface of the tins a small hole of the size of a pins head is left, which, when the meat is cooked is hermetically sealed, whereupon the steam inside condenses and

forms a vacuum. As soon as they are sealed, an apparatus lifts them up and plunges them into cold water, thus preventing the over-cooking which frequently took place while the tins were cooling. Mr. Manning, of Panuba, in Australia, employs in his establishment sulphate of potash and ammonia, and then extracts the air on a plan invented by a M. Appert, who obtained a reward from the French government some years ago for his researches into this question.

The curing process is also conducted on the principle of exclusion of air, but on a larger scale, and by more mechanical means. The great agent for this exclusion is tallow, which may be also used as a cooking agent according to Dr. Letheby's suggestion to the Society of Arts. The way in which he proposed to use it was, first to melt it, then raise it to a temperature of 250° and immerse in it the joints of meat, which, when all the superficial moisture was drawn off, would be packed in the tallow, so as to make them air-tight. It is doubtful how far the interior of a joint would be cooked before the tallow became cold, but there is no doubt at all but that it is one of the very best things to pack meat in, for it fills up every crevice in the most complete manner.

This is the plan adopted at the Australian Meat Agency in Norton Folgate, of which Mr. Tallerman is manager. By his process the carcase is divested of bone and sinew, and steeped in salt brine. Afterwards it undergoes a bath of sugar brine, composed of molasses and spices. The meat is then rolled, tied up with twine, packed in large casks or tins holding 2½ tons, and the tallow of the same animal poured over it when boiling. Each roll of beef weighs 40 to 70 lbs., and those of mutton about 35 lbs. Up to the present time these are the only two methods which have been successful in the English market, all the others being more or less in an experimental stage. Both tinned and cured meats have had great difficulties to contend with. The tinned meat, though it has met with a very large and well deserved sale, is not much sought after by the working classes, who cannot be made to see that 6*d*. per lb. for meat without bone is cheaper to them than the odds and ends of the butcher's stall. At the same time no systematic effort has been made to induce the operatives to buy it, except in the mining districts of Staffordshire, where, I am told, it is in great request; generally speaking, it is the better class which buys it, and not the lower orders of society, who, of all others, require cheap food. It has been reserved for Mr. Tallerman, in a great measure, to supply this want, and it is only bare justice to him to mention the long and arduous battle which he has fought against popular prejudice, for it is a well known fact, that the working classes are

infinitely more hard to convince than those above them. It must be admitted that the prejudice against cured meat was not entirely to be wondered at, as the meat is not very inviting at first sight, and requires more cooking, by which I mean a little management in the way of seasoning, than English housewives know or care to give to it; for where a Continental cook would elaborate a dish to make one's mouth water, an English one will only produce a piece of shoeleather. Mr. Tallerman himself declares that his meats are not offered as rivals to fresh-killed butchers' meat, but only as substitutes for it. The enquiring visitor should go to Norton Folgate about dinner time, and taste for himself the stews and ragouts which form the staple article of many a poor man's dinner; and I am heartily glad to see that the working classes in that neighbourhood are beginning to recognise the fact of their nutritious qualities.

There is, however, a great danger which threatens Australian importations, both tinned and cured, viz., that the increasing demand in England has suggested to some of the Australian shippers, who are not as tender-conscienced as they should be, that it is a convenient way to smuggle their refuse and bad meat with the good. This is a serious matter for colonists to look to at once, for if it ever becomes suspected that the tins and casks do not contain meat of the very best, the hard gained confidence of the people on this side will disappear like chaff before the wind.

In addition to the supplies brought into the market by Mr. Tallerman, and by Messrs. McCall and Co., of Houndsditch, the agents for the Melbourne Preserving Company, New South Wales also furnishes us with a large quantity of meat from the Ramornie establishment on the Clarence River, so that in default of other plans, a very large proportion of Australian stock finds its way to this country.

The fertility of inventors of meat-preserving plans may be imagined when I state that about 2000 patents have been taken out within the last 150 years. But even the chemical preparations are so numerous that I should not have space to enumerate them, and will content myself with mentioning the few which have been considered of any practical value. Though they certainly have one advantage, viz., that they deal with meat as a joint, and thus please our old-fashioned taste for seeing our mutton on the table *au naturel*, none of them seem to have overcome satisfactorily the difficulty of long voyages. Amongst the best known, though not the latest, of these processes is Redwood's, which consists in covering the meat with paraffine, and then with a coating of gelatine, so as to afford it an impervious,

air-tight skin. Paraffine over one's joint did not sound very nice, but it was easily removed by soaking the meat in hot water, when the envelope floated on the top. But even this plan was not sufficient to prevent decomposition. A Mr. Johnson, of Kyneton, Australia, has tried lime with success, as a packing substance, and for dried meats, such as hams and bacons, it would do exceedingly well, though I should doubt its efficiency with fresh joints.

The bisulphate of lime, which Messrs. Medlock and Bailey introduced, is simple, free from annoyance, and very efficient for a short period or for home purposes. The housekeeper in hot weather may comfort her soul with the reflection that the meat is not going bad all at once, if it is brushed over every day with this solution; but with all its undeniable utility, the bisulphate of lime is scarcely the material wherewith to risk the transportation of beef and mutton. Dr. Dewar proposes to subject the meat to the action of sulphurous acid, and afterwards dry it in an atmosphere of 140°, so that the albumen may be preserved in a desiccated state and not coagulate. Half-dried like this, the meat may be kept for a considerable time, but it loses its flavour.

Dr. Estor uses sulphurous acid and chlorine, the burning of which, by means of a pastille, renders the atmosphere in the neighbourhood of the meat perfectly pure, and unfavourable to the development of that minute vegetation which we call putrefaction.

A Mr. Lavers, of Sydney, has taken out a patent for hanging the carcases in air-tight compartments, into which sulphurous acid and carbonic oxide in combination are conveyed. He claims for this invention that the whole meat—flesh, bone, and all—becomes the basis of the sulphurous acid treatment, which he believes may be carried out at a cost of only one shilling an ox. In this country Professor Gamgee is following out a plan of preservation with much apparent success, although, of course, time is required to see how far it will be developed. He first kills the animal when in a state of insensibility from carbonic oxide, which has the great value of fixing the colouring matter of the blood, and thus preventing a sodden appearance; the joints are then transferred to an air-tight chamber, in which is hung up a box containing a mixture of charcoal and sulphurous acid; a current of air is blown in, impregnated with carbonic oxide, and cooled by being passed through a brine bath; the inner box is then opened, and the meat subjected for varying periods to the action of the gases. The results have been received with much favour by some of the largest salesmen in London, and the aspect and taste of the meat is such that it is eagerly bought by butchers.

Next to the chemical preparations come those in which the production of cold is the object desired. The freezing process, as it is commonly called, has taken considerable hold of public imagination, many practical physicists believing that the ultimate solution of the fresh meat question will be obtained by this means. Very great patience, perseverance, and large sums of money have been expended in following out the principle of this invention, which has more than once appeared to be within the grasp. Indeed, as an experiment, the ice has been used satisfactorily, although various difficulties have cropped up to prevent its being carried out into actual practice. Looking at it as a fact, it is a success to be enabled to keep meat under the influence of cold for any given time, but hitherto that success has been only scientific and not commercial; but that the one will follow the other, there can be but little doubt, especially as England, America, Australia, and France are all working simultaneously at it. Frozen meat has its objectors as well as its patrons, some chemists believing, that by whatever process it is frozen, it is liable to sudden decomposition as soon as it is thawed. This, however, is denied by the ice advocates, who say that if the beast is killed in a warm temperature where it can bleed and "breathe" properly, no such consequences can follow. Ice by itself is not of the slightest good for any long voyage, as I have lately heard of a cargo shipped in the "City of Buenos Ayres" which was packed in ice, sawdust, and charcoal, and which had to be flung overboard when only thirty days at sea. Speaking generally, the freezing invention is an adaptation of Faraday's discovery of the liquefaction of certain gases by pressure, and their capacity for absorption of heat on their release from that liquefaction.

When so many people are concerned in this production of cold, differing from each other only in the degree of temperature and the materials employed, there is necessarily a great similarity in the process, containing many assertions of priority of claim to the various details of the invention. With this, however, I have nothing to do, but will simply point out the salient points of the principal schemes, commencing with a few facts relative to the early introduction of freezing. Ether was one of the first materials employed in this country, though with crude and defective machinery, by Harrison, in 1856, and his efforts were improved upon by Siebe six years later. In France ammonia was used by Carré, who economised the process very considerably by condensing it and enabling it to be used over again. The production of cold by the compression and expansion of air was successfully attained in 1862 by a machine invented by Mr. Kirk, of the Bathgate Chemical

Works, and this principle was followed up by Messrs. Mort and Nicolle, of Sydney, which town can certainly boast of being the most energetic in its treatment of the question. Up to the present time their difficulties have been the cumbrousness of their machinery for shipboard, and the cost of the production of the ice per ton. In England, Mr. Reece, in conjunction with Mr. Augustus Morris, of Sydney, who came over in the interests of Messrs. Mort and Nicolle's process, attains his object by the continuous distillation and rectification of ammonia, the great objection to which was, the amount of power which was wasted in the machinery, and the consequent consumption of coals to the ton of ice. When the subject was brought before the Society of Arts in April last, it was 1 ton of the former to 9½ of the later; since then, however, Mr. Reece has very much improved this defect, and is certain of obtaining at least 30 tons of ice to the ton of coal. In that case, a very great stride will have been made towards financial success.

The plan proposed by Mr. Postle, of Sydney, is to stop short of the freezing point, but to keep the air artificially cooled to within one or two degrees above it. This he attains by a very simple application of the laws of heat, in which the air in expanding is made to compress fresh air, so that a large percentage of the power excited in compression, is regained by utilising its expansive force. In practice, Mr. Postle would fit up a ship, holding some thousand carcases, with iron bins, and distribute equally through them cold currents of air, which would return to the machine to be reduced again to the proper temperature.

In this country, Mr. Jeffreys has a somewhat similar scheme. Between the packed joints strong liquid extract, made of the coarse meats, is to be poured, forming a sort of hydrostatic bed, and the cooling material will be vaporised ether and chilled air, the cost of which he estimates at two-thirds of a farthing per pound of meat.

M. Tellier, of Paris, uses two kinds of refrigerating substances, viz., ammonia and methylic ether, which latter he prefers as being much more easy of manipulation. He appears to have been particularly happy in his preservation of fish, having kept for five weeks fish which had not been cleaned, and this, as every cook and fishmonger know, is the most difficult of all preservations. Even if he succeeds in fish and not meat, it will effect a perfect revolution in one of the most important and most neglected food supplies; and as far as the cold air goes, the comfort of travelling in tropical climates will be very much enhanced by the invention, as we understand that the Compagnie Générale Transatlantique is

about to make use of it for cooling the cabins of their steamers and producing ice on board.

Finally, we have America, going ahead with characteristic rapidity, fitting up and sending off her ship, while we are only debating about it. In the simplest form of application, ice cars have been running for some considerable time between Ohio and New York, but a ship is now running between Texas and that city fitted up with pumps of sufficient pressure to liquefy carbonic acid. It thus becomes deprived of its caloric, and the moment it is liberated it assumes its gaseous form and takes caloric from all the surrounding points. In a temperature of 45° in a room 66 feet long, 33 feet wide, and 13 feet high, the thermometer in eight minutes fell 26° below zero, and this degree of cold can be kept up for an indefinite time.

I have thus briefly explained the various proposals to bring over fresh meat by cold processes, all of which involve a higher organisation and more expensive machinery than any of the others. But one other effort has to be mentioned, and a most important one, viz., the transportation of live cattle, which, like the rest, is in a transition state of solution, although enough has been done to show us that the thing is feasible.

When the scheme was first proposed at the Society of Arts, for carrying 1500 head of cattle in specially built steamers, it was thought to be impracticable, and pooh-poohed accordingly,—it seems to me on too insufficient grounds,—for not only in 1862, were upwards of 1700 sheep carried from Glasgow to New Zealand, arriving there in perfect order, but during this last summer, cattle were actually brought from the Plate River, without the least preparation beforehand, and in a steamer not suited for the occasion. Although the cattle arrived in a very thin condition, they soon recovered and sold for £17 a head. So satisfactory was this to the promoters, that they have since despatched the "Ariadne," constructed for the trade, and we may expect to hear of her return about the end of February. If she comes back in safety with her cargo, there really is no limit to the supply of fresh cattle; the rich rolling plains of Texas, the fertile valleys of Jamaica, the pastures of South Africa and Saldanha Bay, will all contribute their beeves and muttons; and although I am not so sanguine as ever to expect meat to be sold at a lower price than 6*d.* per lb., we may be well content with that, and hope that the ugly word "starvation," which too often finds a place in the daily catalogue of our great towns, will become obsolete and a thing of the past.

PHILLIPS BEVAN, F.R.G.S.

COFFEE LEAVES *versus* TEA LEAVES.

Of the hot drinks that form the daily refreshment of the human race, infusions of leaves stand pre-eminent, and particularly those derived from one or other of the various tea plants, which are consumed by more people than all the others united. Tea forms the beverage of the three hundred millions that inhabit China; it is largely in use by the natives of Japan, Thibet, and Nepaul; in Asiatic Russia the poorest enjoy it; whilst in Europe, North America, and Australasia, all classes are unanimous in its praise.

Somewhat akin to tea is *maté*, the leaves of the *Ilex Paraguayensis*, or Brazilian holly. Although not consumed over such a wide area as tea proper, it is as much the universal beverage of the southern American republics as China and Assam tea are of Europe and Asia; but it labours under the disadvantages of being somewhat deficient in theine (the active principle of tea and coffee), and becoming black and unsightly if left to cool. This tendency to darken is owing to a considerable amount of astringent acid, similar to the tannin of oak bark, which enters into its composition.

The principle to which both beverages owe their popularity, exists in the former to the extent of 5 per cent. in green, 2·55 per cent. in black, and 1·25 per cent. in the latter. It is a remarkable substance, and well merits a special paragraph. If tea or maté leaves, reduced to an impalpable powder, be placed on a watch glass covered with a white paper cone and subjected to a gentle heat, minute colourless crystals collect in the form of a sublimate, inside the cone. They are known amongst chemists as theine or caffeine, and are almost identical in their composition. Theine has no smell, a very slightly bitter taste, and seems to exercise little influence on the flavour or smell of the leaves from which it is extracted. But, although quiescent in the leaf, its wonderful properties at once make themselves felt when introduced into the animal economy. Theine is one of a small group of substances which are remarkably rich in nitrogen, possessing nearly three-tenths of its weight of that element, a quantity which exists in only a very few other known compounds. Its chemical composition is as follows:—

Carbon	49·80	
Hydrogen	5·08	
Nitrogen	28·83	
Oxygen	16·29	
	———	100·00

If we divide ordinary wheat into two parts, viz., the gluten or sustaining portion, and the starch, or heat-imparting element, we find that theine fulfils the functions of the former. Possessing this extraordinary property, it stands to a certain extent in the place of food, by lessening the natural waste of the body, so that old people, who can no longer digest enough of ordinary food, find in good tea, food, medicine, a gentle stimulant, a solace to their failing strength, a prop to their declining years. No wonder, therefore, that the fragrant beverage should be equally acceptable to the aged noble confined to his luxurious palace, and the poor sempstress stitching in her forlorn attic.

It must be evident even to the most desultory reader that any new product capable of use as tea or maté, and containing a fair proportion of the same chemical constituent which distinguishes them, is entitled to a niche in popular favour. Such a position we claim for prepared coffee leaves. So far back as the year 1845, Professor Blume, of Leyden, who had spent much time in Java, pointed out that an infusion of roasted coffee leaves had from time immemorial been a favourite beverage among the natives of the Eastern Archipelago. In Sumatra, especially, it formed the only drink of the entire population. Mr. Ward, resident many years at Pedang, in Sumatra, thus wrote to the *Pharmaceutical Journal* (vol. xiii., page 208): "As a beverage, the natives universally prefer the leaf to the berry, giving as a reason that it contains more of the bitter principle, and is more nutritious." This is borne out by analysis, it being found that roasted coffee leaves contain about 1·25 per cent. of theine or caffeine (the same amount present in maté), prepared coffee beans only yielding from 0·117 to 1·08 per cent. The same author continues: "In the lowlands, coffee is not planted for the berry, not being sufficiently productive; but for the leaf the people plant it round their houses for their own use. It is an undoubted fact that everywhere they prefer the leaf to the berry. While the culture of the coffee plant for its fruit is limited to particular soils and more elevated climates, it may be grown for the leaf wherever, within the tropics, the soil is sufficiently fertile."

In 1851 Dr. Gardner showed specimens of prepared coffee leaves at the International Exhibition, when they were most favourably reported on by several tea-tasters, who characterised the infusion as resembling Congou or even Souchong. Their favourable opinions were further corroborated by analyses from eminent chemists of the period. Nevertheless, no active steps have apparently yet been taken to introduce such an important product into our markets, for which the way has already been smoothed.

Adulterations Discovered in Tea by the

Investigations of the Food Journal.

a, Magnet.

b, Rice husks and straw.

c, Rice blackened with plumbago.

d, Silk Worms' droppings.

e, Tea leaves and maggots.

f, Iron filings.

g, Fragments of limestone.

h, Minute seeds, name unknown.

i, Scorched tea buds and husks.

j, Fragments of willow leaves and stalks.

Fig. 9.
Thea Chinesis.

Fig. 10.
Thea Assamica.

Natural size

a. Flowery Pekoe.
b. Orange Pekoe.
c. Pekoe.
d. Souchong.
e. Congou.

After infusion.

Although the whole subject, including the growth and manipulation of China and Assam tea, has been intermittently agitated among the Ceylon planters for some time past, yet the only reply has been in the form of a dismal growl, "it will not pay." But so far as we can learn, beyond experimenting on a very limited scale with those leaves which, when the ripe berries are being picked, fall along with them into the baskets; or with some of the withered leaves blown off the bushes during the windy season,—the special growth and manipulation of coffee leaves for our markets have not really been tried. It would indeed be hopeless to anticipate success for leaves so derived, when brought into competition with China and Indian tea, cultivated and manipulated with all the care acquired from long centuries of experience. To expect a crop of both leaves and fruit from the same plant would be as absurd as to suppose that withered leaves could be converted into high-class tea. On the other hand, it evinces a very partial acquaintance with vegetable physiology to look for fine, well-developed berries on plants which have been systematically denuded of their young and tender leaves.

In the absence of an experimental consignment of prepared coffee leaves it is impossible even to conjecture what price they would command. Tested alone by the quantity of theine the samples examined have been found to contain, they could scarcely take a higher position than good ordinary black tea worth about *1s. 2d.* per lb.; still it must not be forgotten that the few authentic analyses to which we can point have probably not been made of leaves specially grown, plucked, and manipulated, and that a subsequent examination of carefully prepared coffee leaves may reveal a considerable increase in the percentage of this important element.

Judging from Mr. Ward's remarks on coffee cultivation in Sumatra, from what we know of China and Assam tea, and our information as to the climate of Ceylon and the East, we believe that in order to obtain the best results, the Ceylon valleys should be devoted to coffee leaf culture, the lower slopes of the hills to the berry, while China tea might be grown above the limit of coffee cultivation.

WILLIAM COCHRAN, M.R.A.S.

POPULAR FOOD ANALYSIS.

No. 1.—BUTTER.

We have been during the last month engaged on the examination of London butter; and, in stating the results of our investigations, we will notice, (1) What butter ought to be; (2) What has been said about it by writers on adulteration; and (3) Our own experience as to the extent of its sophistication, with simple and popular directions for testing its purity.

Butter is supposed, as we all know, to be the fatty portion of milk, which is first removed from that fluid as cream; and, subsequently, after being allowed to turn sour, violently and rapidly stirred and beaten by means of a churn. The fat of cream consists of numerous little globules, and the effect of the strong and rapid agitation it undergoes in this process, is to cause those globules to break up and unite together, thus forming the rich and palatable masses of fat which we call butter. After leaving the churn, it is submitted to a process of kneading, so as to remove entirely all the mechanically entangled fluid, and a small proportion of salt is generally added, to assist in keeping the finished article from too rapid decomposition. Even under careful treatment, the fat thus produced will still retain a little water; and, when it is to be packed for travelling, a considerably larger quantity of salt must be added; but we have Dr. Calvert's dictum from an extended series of experiments, to the effect that the former should never exceed 10, nor the latter 2½ per cent. of the whole bulk, even in the most ordinary qualities. It is thus evident that butter ought to contain nothing but the pure fat of milk, mixed with proportions of water and salt not exceeding in quantity the amounts above stated.

Let us next see what has been said about butter by the various writers on adulteration. These authors declare it to be extensively sophisticated, and that the principal adulterants used are *water, salt, starch, lard, and other animal fats.* According to the report of the Lancet Analytical Sanitary Commission, we find that, out of many samples of butter examined, the great bulk were found to be adulterated by means of one or other of these contaminations, but principally by water and salt. Many of the samples examined contained 20 per cent. of these matters, some 30 per cent., and one as much as 35 per cent. More recently, according to the statements of "One who knows," in the *Daily Telegraph*, the adulterations have

become more scientific, and silicate of soda is now added to the tallow used for mixing with butter, with the double object of increasing its weight, and of giving it an appearance of lightness. Chloride of calcium, and other very deliquescent substances, have also been said to be put in with the salt, to assist the grease in retaining moisture, all of which tend, as the above correspondent coarsely but graphically puts it, "to make our stomachs into washing-powder packets."

After the publication of such statements, and the amount of corroboration they received from time to time, it would surely have been not unreasonable to expect that public opinion, coupled with the powers given to local boards by the "Adulteration of Food" Act of 1860, ought to have in some measure secured us immunity from continued sophistication; but the doubtful appearance of much of the butter that we buy, coupled with the recent exposures by the press, of the "Dutch butter factories" in London, have led us to renew the enquiry, and with what result will be seen below.

While on the subject, it will not be out of place to give a statement of the butter question as it exists in Holland, communicated to us by a gentleman himself engaged in the trade. He states that it is not the Dutch, but the English merchant, who is the cause of the sophistication of butter in Holland. The grease is prepared in England, and exported to Rotterdam for the express purpose of making cheap butter for the English. In Holland itself such a made-up article is practically unknown, as butter is only used there by the better classes, who can afford to pay a good price, and is, in fact, considered an article of luxury. The labourer never eats it, but uses suet or fat instead, and it is even too expensive for mechanics. Deterioration of butter is only practised on behalf of the English market, and is an English invention. To adulterate the butter, it is melted, and water and tallow are then stirred in, to the amount of about 30 per cent. Besides these matters, mashed potatoes, flour, gelatine, and a large quantity of "cheese stuff" are often introduced. In thus serving the views of their English customers, the Dutch have, however, spoiled the old reputation of their butter. The good article is still produced at Delft and Leyden, as neither the merchants there, nor at Amsterdam, will assist the English speculators in sophisticated stuff. A few years ago the Board of Commerce of Delft tried to combat the adulterators, and to relieve their produce from the stigma cast upon it. They sent real butter of good quality to the English market, at the lowest possible price, but they could not succeed, as the cheaper, falsified article suited the trade better; and so they were obliged to

relinquish their project, after losing a considerable sum of money. This is the case from a Dutch point of view; and, doubtless, although it is very humiliating to our nationality, there is much truth in it.

We now proceed to the consideration of the actual results obtained, which we have, for simplicity of reference, placed in a tabular form. Our samples have been collected in such a manner as to avoid the difficulty of our object being suspected, and better qualities substituted; and we think that our table of results very fairly shows the true state of the butter supply in London at the present date.

Table of Results Obtained from London Samples.

Price.	Where bought.	Water (per cent.)	Salt (per cent.)	Other impurities detected and remarks.
1/10	Ludgate Hill	9·00	1·13	
1/10	Waterloo Road	5·50	0·25	Slight grease and trace of manganese.
1/6	Walworth	5·50	1·60	
1/6	Kingsland	4·80	2·11	
1/6	Barbican	7·00	0·76	
1/6	Bishopsgate	9·90	1·53	Trace of manganese.
1/4	Barbican	3·99	0·90	Grease.
1/4	Blackfriars	15·76	2·00	„ slight.
1/4	Leather Lane	11·16	1·00	„ „
1/4	Hoxton	10·88	1·00	„ „
1/4	Walworth	7·92	2·00	„ „
1/2	Leather Lane	5·50	2·60	„
1/2	Blackfriars	45·30	4·36	
1/2	Hoxton	9·15	1·00	„
1/2	Walworth	11·19	4·28	„
1/2	Ditto	8·50	1·70	
1/2	Barbican	15·41	2·90	
1/-	Leather Lane	25·90	3·20	
1/-	Kingsland	10·83	2·60	„
1/-	Lambeth	13·66	5·60	„ large.
1/-	Walworth	15·57	3·56	„
1/-	Hoxton	13·20	3·20	„
1/-	Bishopsgate	23·57	4·90	
1/-	Blackfriars	13·76	3·82	„ and starch.
1/-	Ludgate	13·11	2·34	
-/10	Walworth	18·82	3·48	

Thus we see that, judging by the amounts of water and salt given above as existing in pure butter, out of twenty-six samples tested, fifteen were more or less adulterated. Except in four cases, however, the water of adulteration does not exceed 5 per cent., nor the salt 1 per cent., and it is worth noting that, in those cases where the old falsifications are employed to any extent, the comparatively more recent one of tallow is absent.

That the extensive sophistication by grease is in some degree a modern one, is proved by the fact that, in former food reports above

referred to, it was stated that "animal fats are occasionally, though not frequently employed, as the fat of veal or lard," and we have therefore been interested in discovering the cause of its becoming popular. After diligent enquiry we found that nearly all the grease used in this way is produced by one large firm in London, from whom we readily procured samples. On examination this proved to be almost entirely pure beef fat, and *as grease* it was certainly a most excellent article, and free from any trace of the silicate of soda mentioned by "One who knows," which substance, by the way, we could not discover in any of the butters. This grease has a fine white colour, is entirely devoid of odour except when heated, and is produced and sold at 52*s*. per cwt. Its advantage in price to the sophisticators is therefore evident, if we consider that common butter is 134*s*. per cwt.; and, to show that these gentlemen know its value, it is actually consumed to the amount of 1000 firkins or about eighty tons weekly. The adoption of this mode of adulterating butter is, therefore, evidently due to the production of this purified grease; and, as a return of the compliment to our Dutch merchant already quoted, we may mention that we were informed that its manufacture was first perfected by a Dutch firm, who established their works at Hackney!

In two samples we discovered traces of manganese, and were at first at a loss to account for it, but it seems that some "knowing ones" are in the habit of buying up stale butter at a low price, and submitting it to a process of washing in a weak solution of an alkaline permanganate. The material used in practice, as we are informed, is Condy's disinfecting fluid, and the butter, having been rendered inodorous by this means, is resalted and subsequently washed with a little milk, and sold as "fresh Dorset butter," at say 1*s*. 8*d*. or 1*s*. 10*d*. per lb. This manufacture of "Epping" or "Dorset" butter is not new, but, by the help of a little chemistry, it is carried on with less labour and more success than formerly, although, thanks to the manganese, which is not generally entirely washed out, it may be easily detected by the analyst.

We now come to the last portion of our subject, viz., simple directions for the examination of butter; and in giving these, we wish it to be clearly understood, that they are not intended for scientific men, but simply for popular use by any persons who, although unacquainted with chemical manipulation, may still desire to test the butter used in their households.

1. WATER.—Procure a long and narrow but wide-mouthed phial and fill it with pieces of the butter to be tested. These pieces should be cut off gently with a thin knife, and be of such size as to

FOOD AND DISEASE.

The Science of Life, daily acquiring greater exactitude and completeness, teaches us that as the distribution of food regulates the distribution of animals over the earth's surface, so does the human family branch off in various directions, seeking that abundance, denied it when clustered in dense masses over limited areas of country. Human art has sought every means whereby the pre-eminence of old and wealthy centres of civilisation might be maintained. But the inexorable laws of nature compel submission—a submission *forced* by famine, under the walls of stately buildings, containing the gold and silver of the wealthiest people in the world, and *illustrated* by the humiliating spectacle of thronged poor-houses, and vigorous men seeking transportation to the antipodes, that they may have a chance of "self-help."

Nature has destined that we should be scattered, and whilst the "onward" cry is but the utterance of an instinctive impulse, the observant cannot fail to marvel at the apparently cruel means adopted to enforce Nature's intentions. The religious intolerance and persecution which drove the Pilgrim Fathers to seek a virgin soil exercise but a feeble influence now. The erratic fancies of some, who are born apparently with the strongest animal will and propensities, may colonise and people a wilderness. They snap their fingers at a country's constitution and laws, until steam directs such a current of gentiles into their midst as to secure to humanity all the advantages of a well organised pioneer's settlement, with ultimate conformity to the regulations most conducive to the result that they shall increase and multiply.

The fear of injury and death operating wherever plagues appear; the Mecca pilgrims sowing the seeds of cholera, which starts forth in many directions, and produces, in a thousand ways, a stampede of which no faithful picture can be imagined but by a few learned in medicine; the malaria which pervades the swamps, or the rich and untilled soils of very fertile lands; the London fog that drives the asthmatic to Australia; these, and a thousand similar influences, constitute apparently the lashes and the tortures which compel old and young, rich and poor, strong and weak, to leave the scenes of their early life, and search for fields fresh and pastures new, where

to sow is to reap, and the balance of life can undergo a further adjustment.

The failure of crops, the potato disease for instance, started an exodus from a thronged island to people the New World.

And now I turn to the least understood of the influences which, affecting the supply of food, tend to scatter and impoverish a nation. The dread of "Carbonchio" has long since rendered desolate during the summer months some of the finest valleys of "the garden of Europe." Flocks of sheep and goats, followed by shepherds and their families, and guarded by fine wolf-dogs with spiked collars, move silently through the towns and villages of Southern Italy in spring and autumn on their way from the lowlands to the Appenines, and *vice versa*. But for the bells hanging to the rams' necks we should often scarce know that a migration of people was actually going on. Towns are traversed at night or early in the morning, when all is quiet, and those who have sought a mild climate in the south would scarcely believe if told, that pestilential miasms cause the desertion of huts and lands hard by, during at least four months out of every twelve. The steam plough and thorough drainage are destined to exterminate anthrax, whilst they will limit the spread of human consumption, but until the days come when to seek elbow room a man is compelled to remain in a swamp, we may expect the perils of travel to be preferred to the toil and danger of digging and drying the earth in unwholesome regions. The carbonchio of Italy, the bêscle of the Pyrenees, the boil plague of Siberia, are all blood diseases, attacking animals first and capable of communication to man, which operate in many instances in favour of depopulating certain belts of country, at all events for certain seasons, and developing a taste for adventure which is far from useless in the dissemination of human beings. Creatures of habit, we attach ourselves to places and people so strongly, that any circumstance favouring displacement tends, sooner or later, to form the explorers and travellers ever seeking new lands and a new sensation.

It is no stretch whatever of facts or the imagination which enables us to strike an interesting and most instructive contrast between Italy and the British Isles. A hot climate and peculiar formations have given Italy fatal local diseases amongst ruminants, which here assume the mildest types. Italy is a peninsula, and the Alps have not prevented the invasion of Northern Italy, the part most famed for horned cattle, by rinderpest and lung plague to an extent that we knew nothing of prior to 1842. For one outbreak of rinderpest in Great Britain, Italy had in days of yore

its dozens, and for one pound of British money lost to our farmers, hundreds were lost in the provinces of Lombardy, Venice, and the Papal States. For generations and centuries the resources of Italy have been sapped by foreign as well as indigenous diseases, so that we cannot wonder if her animals are not the finest in the world, and if her agriculture be not ours. I have not chosen Italy for my contrast because it has been in a worse position than other Continental nations; it is a fair type of a large group.

The British Isles, with a genial climate, ever-green pastures, and an ocean barrier, have in a great measure constituted the spot of "natural selection" for improvements in the art and the development of a science of agriculture. Britons pride themselves on being more practical and keener observers than other people. In this they are not quite correct, but circumstances, climate, necessity, everything in fact, that tends to make a man fit for sustained effort, with the incentive for such, may be said to have brought forth here that type of humanity, weighed down in caricature by lumps of fat, but characterised by an iron will and a muscular frame. We have thereby secured a heavy percentage of sound thinkers. "*Mens sana in corpore sano.*" It is beyond my purpose to trace all the influences which have often diverted us from a just appreciation of the learning, acuteness, and thoroughness of foreigners. Diversity of tongues has done not a little for us in relation to matters coming within the scope of this article.

Whilst schools were being established in various parts of the Continent, to teach a body of men who might make it their business to protect mankind from the irreparable losses incidental to cattle diseases, we slumbered. A Frenchman gave us a start. Vial came from St. Bel, near Lyons, seeking protection from the animosity inspired by his turbulent spirit or his talents, in the breast of Bourgelat, the founder of Veterinary Schools, and started one on a sound basis in London. He soon died, and, but for Parliamentary aid, the College he established in St. Pancras would soon have ceased to be. I shall not enter on the blunders committed, or the effectual means adopted since to check scientific research and scientific enthusiasm. What I must indicate prominently is, that whereas preventive medicine received a great impulse by the labours of Coleman in relation to ventilation, the subjects of primary importance to an agricultural community, and a knowledge of which would have enlightened political economists in the days of free trade agitation, were ignored. Our veterinary literature failed to keep pace with the veterinary science of the Continent. We had our pioneers,—men who deserved some of the crumbs which

contributed to Coleman's great fortune; none deserved so much as Delabere Blaine and William Youatt. The latter wrote on cattle and their diseases, established the Veterinarian, and secured the establishment of a Professorship of Cattle Pathology. But even his efforts failed to open the book of Nature sufficiently for the guidance of Sir Robert Peel and his supporters. The veterinary profession under Coleman had contributed largely to the development of an opinion pervading all medical circles, that "fresh air" was the universal panacea. Dirt, confinement, and ill-usage were charged as the causes of all the sickness amongst domestic quadrupeds, and twenty or thirty years since, the proposals first made in 1714 by Bates, Surgeon to the King's Household, for the prevention of Cattle Plague, were regarded as relics of the dark ages, miserable products of ignorance and superstition. They are of great historical importance in these days, when human physicians have acquired a taste and talent for "stamping out" contagious fevers. Mr. Bates suggested the following regulations:—

"1.—That all cows affected with disease should be burned. That all catching the malady afterwards should be burned.

"2.—The stables in which the sick cows stood were to be washed and disinfected by burning pitch, tar, and wormwood.

"3.—The fields on which sick cattle had grazed were to remain empty for two months.

"4.—Persons attending on sick cattle were not to go near healthy ones.

"5.—Cowkeepers were to be instructed to separate any cows refusing food, and the cases were to be reported to the authorities.

"6.—Cowkeepers were to separate their stock into small lots, each of which was to consist of not more than twelve animals. All complying with the orders were to receive compensation."

Mr. Bates spoke words of wisdom in relation to the prevention of a disease known to be contagious. The complete extinction of rinderpest last century, and our immunity from all "catching" distempers amongst cattle, drove our profession into the belief that they had no great scope for effort except in the daily practice of bleeding and dispensing physic. The organisation of veterinary inspectors, or a veterinary department under Government, was looked upon as a foreign element peculiar to paternal Governments. There was no necessity for it. Our forefathers, whose history had been forgotten, blamed the Danes and the Dutch for sending us cattle diseases; they stamped out the imported plagues, and laid the foundation for an age of great agricultural prosperity, and the formation of superb herds of cattle, by closing our ports to foreign

animals and epizoötics. Youatt's book gave us a description of British cattle in health, and his chapters on breeds are infinitely better than those on cattle disease. All this was indirectly due to the efforts of Bates, Cullen, Mortimer, Layard, and others, who rendered our stock-raising possible, and the amount of cattle destruction a minimum.

The good old days and the good old doctrines formed no part of the study of veterinary surgeons thirty years since. The idea that a Frenchman or a German could teach an English groom or shepherd anything about animals, was considered preposterous. Have we not the finest animals in the world? Ergo, must we not be the wisest people on earth in relation to the management of those same animals? The French might write about "Cocotte;" Gerlach might talk learnedly, convincingly, and with effect, in Prussia, as to the contagious nature of the lung disease; and the Russians were engaged in attempts to exterminate rinderpest; but we ignored all, and knew nothing even of the names of these diseases. Youatt confounds all the plagues under one head, and speaks of pleuro-pneumonia as a strange form of pleurisy mentioned by Lecoq. Our aristocracy travelled at great cost; but the daily intercourse which enlightens us now on Continental events, was then unknown. How could Sir Robert Peel, Mr. Gladstone, and others, foresee that throwing open British ports for foreign supplies of animal food was the best and safest means to curtail supplies, and strike a blow at our resources, which several decades would fail to repair?

It was indeed prior to free trade in live-stock, that experiments were made in crossing some of the breeds of these islands with those of Holland, reputed excellent for dairy purposes. The foot and mouth disease and pleuro-pneumonia prevailed extensively abroad; and, since the first of these is transmissible with great readiness, and by all warm-blooded animals, it is not surprising that the earliest importations, small but practical experiments in free trade in live animals, before receiving the sanction of Parliament, led to accidents such as our farmers have had to bear ever since.

An article bristling with figures is often laid aside by those who ought to learn the truth on these subjects; but, without reference to tedious statistics, it is easy to prove that the deterioration in quality and quantity in the animal food available for our people, began thirty years since, and has continued.

All well informed persons will admit that outbreaks of foot and mouth disease such as we experienced in 1839, 1840, and almost every year up to that of 1869, have led to an annual loss of several millions,—some say five, others seven,—in meat and milk. The loss

is irreparable; and there is no compensating condition. Every million sterling lost means something like the loss of 150,000 tons of animal food. It means more; but we have all to gain by under-stating the case. Foot and mouth disease often leads to a waste of more tons of milk than meat; and our large towns, once provided with some milk even for the poorest, have been deprived of the very aliment, the want of which could not fail to affect in the most serious manner our infant population. The days were when the poor of London, Edinburgh, Dublin, and other towns, could have a supply of milk for their children. The foot and mouth disease stopped that.

Anyone having the patience for an independent enquiry, will find that the waste in milk among cows, and of flesh on steers made ready for the butcher, caused by epizoötic aphtha, or foot and mouth disease, has, during the past thirty years, robbed our people of not less than between two and three million tons of animal food. A practical farmer has stated the money loss at £250,000,000 sterling. My estimate would allow nearly £100 a ton for wholesome animal food.

I have thus only dealt with a benignant and non-fatal epizoötic; and yet it is in more ways than one most dangerous in its results,—it is communicable to man. Medical men have, it is true, failed to discern any great connection between human and cattle diseases. They have not witnessed eruptions to any extent amongst children fed on the milk of sick cows, but such eruptions do occur; diarrhœa is a frequent sign of the human disorder; and when we consider that Jacob and Hertwig boldly drank the milk of a sick cow, and took the disease, it must be admitted that infants are more likely to be injured than strong men. The observations recorded are too numerous and circumstantial to admit of any other interpretation than that human beings occasionally suffer from foot and mouth disease. Unfortunately, in medicine, the direct relation of cause and effect is not often ascertained with care and promptitude. Is it not a rule, rather than an exception, that the causes of infantile derangement are involved in mystery? We may hereafter enlarge on this subject, and shall, therefore, proceed to consider the losses sustained by pleuro-pneumonia in cattle.

Eighteen years since, frequent visits to London dairies disclosed a condition of things of which I had heard and read no description, and which riveted my attention to the subject of cattle plagues. In one week I saw from a yard near Gordon Square twenty-one dead animals carted out of cattle sheds containing on an average 200 cows. The old system of town dairy keeping had scarcely died out. In some of the stables a bull was kept, and the cows turned out

when dry to calve, and gain some vitality for another season's life in London. But the busy disease rendered impossible a practice that a few years before was almost universal. It is true that a cow-keeper would, in bygone days, purchase old cows who had served the breeder's turn in the country, and live their last year or two in a mews or a cellar. In 1830 a town cow might be considered good for three or four years, yielding a calf annually, and a large quantity of milk. In 1850, pleuro-pneumonia had reduced the average duration of a town cow's life to *six months*. The good breeding cow in moderate condition, once common in Smithfield market, was replaced by fat short-horns, "fit to kill" so soon as loss of milk and a grunt indicated the fatal complaint. Thousands and tens of thousands have annually been driven or carted out of town dairies sick, for human consumption, within two months of the date of their purchase in a public market. And this has been dignified by the name of "salvage."

The cows I so often saw removed sick from the London sheds, nearly twenty years since, went to the butcher. Their carcases were "polished," that is to say whilst still hot, rubbed over with fat from a healthy beast. Their ribs were "skinned," so that the adhesions to the membrane lining the chest might be removed. Even the diseased lungs found their way to the sausage machine; and it cannot be wondered at, if the editor of the *Times*, receiving a letter from me with these revelations, returned it with compliments, stating that it was all too horrible to be revealed in the columns of his paper. We have grown less squeamish of late years. Even Parliament has tacitly sanctioned the sale of carcases of diseased animals, under the "Contagious Diseases (Animals) Act." This is in accordance with an opinion expressed by the veterinary advisers of the Government. When asked whether the lung disease should be "stamped out" like the plague, the reply given by Professor Simonds was, "Not only is the flesh of animals affected with pleuro-pneumonia, in its early stages, a safe article of food, but there is little or no risk of spreading the disease by allowing the flesh to be sent to the meat market. The offal also, excepting certain parts, does not need to be destroyed. On the contrary, every part of the body, and also all excremental matters, are thoroughly impregnated with the germs of disease in a cattle plague animal. A salvage is, or has to be made in the one case, and not in the other; and this necessarily interferes with the adoption of the stamping out process."

A few years more will reveal to all the folly of continuing, even under an Act of Parliament, to eat the carcases of sick animals.

Why is the cattle plague no more? Because it killed so quickly, that we were compelled to bury hides and all,—there was no salvage. The country took fright, stamped out the disease, and cut short losses which might have led to the annihilation of our stock, but which constitute now but a very small amount, compared to the losses by the lung disease. I must repeat with emphasis, that it would have been more to the interest of meat consumers and farmers, had there not been the "salvage" in the shape of marketable carcases of animals stricken with the lung plague; and the sooner we compel them all to be buried, under the most stringent regulations, the better. We should then cease to hear reports, such as the one published for November, 1869, which tells us that "pleuro-pneumonia exists in forty counties of England, Scotland, and Wales; and as many as 165 fresh outbreaks have been reported as occuring in one week in November."

For many years no statistics were published which would open the eyes of Government to the fearful ravages by the lung plague.

Live-stock insurance companies, unknown prior to free trade in stock, were started so soon as the lung disease had sufficiently alarmed our farmers, and the causes of their ruin is easily ascertained from their books, the valuable records in many of which I first sought in 1861 and 1862. Amongst a mass of information, I learned that for the six years ending 1860, the average annual loss of cattle was 4·915 per cent., or amounted to 375,850 head over the three kingdoms. The estimated total loss for the six years was no less than 2,255,100 animals. The value of animals lost amounted to a grand total of £25,934,650, and of this more than one half was due to pleuro-pneumonia. During the six years, we lost twice as many animals by lung disease as the total importations of horned stock from abroad; and in estimating values, it was found that the cattle lost were worth 5·89 times the value of those imported, and more than half this loss was due to pleuro-pneumonia. At a later period, I confirmed my original inquiries by comparing the losses incurred by the three largest insurance companies; and demonstrated that whereas, prior to 1842, our losses could not be estimated at more than 1½ to 2½ per cent., the importation of foreign cattle and pleuro-pneumonia, involved us in losses varying, in different parts of the country, from 5 to 7 per cent. per annum.

In 1863 and 1864 my efforts were directed to securing legislation for the prevention especially of the lung plague and foot and mouth disease. I was not successful, and 1865 brought us the cattle plague, which we were ultimately compelled to exterminate; and, in

the process, nearly exterminated pleuro-pneumonia. Ireland remained contaminated with this disease; and no sooner was the traffic in cattle re-opened in Great Britain, than we had an increase in the number of its outbreaks, and that increase has gone on steadily up to the present moment.

We need look no further for the cause of much destitution and starvation in this country. We cannot lose the valuable animal produce of the land by millions of sterling's worth, without driving the poor to other countries. Emigration cannot be viewed as a calamity, but we have no right to starve out our skilful mechanics and industrious labourers that have cost the nation a large sum of money. When we consider that the remedy is in our hands, if we only follow the dictates of science and practical experience, it is tantalising to watch the animal waste,—a waste of the best blood and power in the world.

Our remedy lies in slaughtering all foreign stock at our ports, and extirpating contagious diseases from our farms. We must make up for past waste by importing preserved foods from every available point, and in this direction a great deal will be achieved soon. The beef and mutton of the Russian Steppes, of the South American Pampas, of our Cape farms and Australian runs, must repair the injury inflicted on us by thirty years' disease amongst British live-stock. Many may emigrate, but millions remain to be fed; and it is our duty to see that they are fed abundantly with the wholesome produce of fertile pastures, and not with the diseased animals which folly and ignorance have compelled us to swallow since 1842.

JOHN GAMGEE.

BREAD MADE FROM WHOLE WHEAT.

It certainly seems rather late in the day to learn how to make bread; but when we reflect that the people of Europe are frequently condemned to eat coarse, heavy, clammy, or sour bread, we may admit at once that it is never too late to mend.

When told that it is quite unnecessary to convert wheat into flour before making bread, one is inclined to express some astonishment; but seeing certain colours are now mixed, and that on a large scale, without any previous grinding, and without any rubbing at all, thus sweeping away with the greatest expenses that attended the trade, we may not refuse to listen to a plan for doing away with the use of millstones, bolting cloths, and all the paraphernalia of the flour manufacturer.

The new system of bread making is the invention, as we believe, of a Frenchman named Sezille. Let us state, by way of preface, that according to some scientific men the total amount of indigestible matter, or bran, in wheat is not more than from 4 to 5 per cent. of the whole; by the present method of flour grinding and bread making, scarcely 80 per cent. of the alimentary part of the wheat is made available. The average quantity of what is called in France, *pain bis-blanc*, whitey brown, or good household bread, is said to be 112 kilos. from 100 kilos. of wheat; M. Sezille says he can obtain from 145 to 150 kilos. from 100 kilos. of wheat. This is an economy of one-third, or nearly so, and would, according to the inventor's account, save in France alone, twenty-five millions of hectolitres of wheat per annum. A hectolitre is equal to twenty-two gallons. We leave our readers to calculate what England, or what the world would save, should M. Sezille's plan turn out as admirable as it looks at first sight, and be universally adopted.

Now, for the method itself, which is divided into three successive operations:—

Firstly.—The wheat is placed in a mash-tub, or other vessel, with more than sufficient water to cover it, and well stirred with a peel for some minutes; by this operation all the over light or damaged grains, as well as dust and other impurities, will rise to the surface, be dissolved, or held in suspension; at the end of half-an-hour the

water is drawn off, and the wheat, having been allowed to drain, is afterwards placed in a cylinder of plate-iron, pierced or worked, so as to have the effect of a rasp, when made to revolve. With the aid of this cylinder, from 2 to 3 per cent. of the outer pellicle, which is the coarser, is easily removed; as to the second skin, and that in the crease of the grain, it only amounts to about 2 per cent.; and might all be left in without injury to the nutritive quality of the bread.

Secondly.—The grain is now placed in a vessel filled with water, at a temperature of about 75° Fahrenheit, in the proportion of about two parts by weight of water to one part of wheat, so that there shall be a certain quantity of water above the grain; to this water is to be previously added one part of half-dry yeast and five or six ounces of glucose to 200 parts of water. The ferment in the water acts gradually upon the wheat, and after immersion for twenty or twenty-four hours, according to the nature of the grain and the temperature, the wheat will have absorbed from 50 to 70 per cent. of water, and be ready for panification. The water will now have become of a reddish colour, having extracted an amount of the colouring matter from the remaining bran, and is allowed to run off; thus another step has been made towards the bleaching of the dough.

Thirdly.—After the wheat has been again drained, it is made to pass through one or more pairs of rollers, and, being of the consistence of cheese, it is easily reduced to a paste; by this operation the bran of the second skin has become excessively finely divided, and equally mixed throughout the whole mass. This being done, and the dough placed in a trough, the proper amount of salt to give flavour to the bread is dissolved in water and poured over the dough, and, should the wheat not have absorbed more than 50 per cent. of water, 15 to 20 per cent. more is now to be added, and the whole is well mixed by being turned over two or three times by hand. The dough is now treated in the ordinary way, rolled and made up into lumps, and left to ferment until the right moment for putting it in the oven.

There is certainly nothing unreasonable in this process; the machinery is of the simplest kind, and the processes such as any baker could carry out without difficulty. It well deserves a trial, and, although the wish has an ungrateful sound, we heartily wish that M. Sezille may have found the method of dispensing with the use of mills, millstones, bolting machines and flour sack, and even with the jolly miller and his men.

G. W. Yapp.

PUBLIC HEALTH.

In the first number of a journal devoted to sanitary questions, and addressed to general readers, it will not be out of place to explain shortly what is meant by the Public Health. Sanitarians have been endeavouring since the commencement of the century to urge it upon the attention of private individuals, municipal bodies, and on one government after another, with but partial success. The cholera epidemic in 1848 made a deeper impression on the public mind, and more was effected by panic in a year than by close reasoning in ten. A Public Health Act was passed, a general Board of Health established, with a medical officer of health as its official adviser in sanitary matters.

Measures of a more partial nature, such as the Factory Acts of Sir Robert Peel and Lord Ashley, the Lodging House Acts, and others, were carried from time to time by the exertions of philanthropists, and relieved some portions of suffering humanity. By the Public Health Act of 1858, the Board of Health ceased to exist, and the powers previously vested in them passed over to the Privy Council, which thenceforward became the accredited protector and adviser in all matters connected with the Public Health. But in spite of these and numerous other Acts, it must be confessed that our legislation on sanitary matters has been fragmentary and spasmodic, that, from fear of centralisation and other causes which cannot now be discussed, it has fallen very far short of the requirements of our very complicated system of municipal and parochial administration.

A Royal Commission is now sitting to inquire into the anomalies of our sanitary code. The British Medical and the Social Science Associations have united in urging the necessity for further measures in relation to Public Health; the subject is often discussed in the press, and meets us everywhere in the current literature of the day. What then is its scope and meaning? Man's health, as an individual, has been well defined as "the greatest energy of each part compatible with the energy of the whole," and this state is continued only by obedience to certain conditions. The relations of the human body to the air which surrounds it, to heat and cold, to the ood it absorbs, to the poisons in or around it, must be observed, or

ill-health is the result. Instinct and experience have done much towards framing a code of personal hygiene: they have taught the savage to protect himself from cold, to select the nutritious from the poisonous fruit; but as social life becomes developed, instinct and experience prove all but powerless in the absence of a further knowledge of nature's laws. If a man builds a house, he is at once involved in the difficult problems of ventilation, heating, and drainage; as food becomes more plentiful and varied, questions arise as to the wholesome and the unwholesome; with the growth of wealth and luxury come new wants, fresh complications, and diseases unknown in the primitive state. When man becomes a member of a community; when the increase of population, the exigencies of trade and other causes lead to the formation of villages and towns; when densely packed masses of human beings have bartered their birthright of pure air and the crystal spring for the atmosphere of a crowded court and water drawn from a filthy well; when the mine and the workshop and the giant manufactory are peopled with living beings, and ships are sailing every sea,—problems arise which are unknown to the individual or the family—problems which are amongst the most difficult, as they are amongst the most important, which can fall to man to consider.

The health of a city or of a people may in some sort be compared to that of an individual or of a family, and the Health Officer of the one may be held to represent the ordinary medical adviser of the other. The duties of the Health Officer, however, are higher and more responsible; his province lies with the prevention as well as the cure of disease; it will be his care that each unit in the great army under his charge may have at least a chance in the battle of life. He fulfils at once the twofold function of official adviser and medical referee in matters of Public Health, and his study will be those complex conditions on which the health of a community is found to depend—the great laws, in short, of sanitary science and public hygiene.

It will be my endeavour in the following pages to pass in review, as far as space will allow, the various conditions, social as well as physical, of a people's health; and to point out the great questions in connection with each, which are even now awaiting solution: and, first, of climate under its double aspect of meteorology and medical topography.

Climate.—Every portion of the globe possesses certain physical conditions, such as configuration of country, geological structure, altitude or depression, vegetation, sea or river, which, acting on and

modifying the imponderable forces of nature, give rise to what we term climate. The moisture in the air, the prevailing winds, the amount of sunshine or of rain, of heat and cold, are influenced and controlled by the natural features and geologic structure of the soil. What may be the action of these agents, apart from other conditions, on health, what part they take in the peculiarities of constitution and of race, is not so easily defined. "Man," says M. Boudin, "is in more respects than one the mere expression of the soil on which he lives," and this extreme estimate of the moulding force of external nature has been ably advocated in one of Mr. Buckle's most engaging chapters; but, without attempting to assign any precise value to this or that modifying force, the real influence of climate on the health and development of man cannot be doubted. The wise physician pictured by Hippocrates is "he who has a due regard for the seasons of the year and the changes which they are observed to produce, to the states of the wind peculiar to each country, and to the quality of its waters; who marks carefully the locality of towns and of the surrounding country, whether they are low or high, hot or cold, wet or dry,"—and the advice of the great sanitarian was the result of a profound knowledge of nature's laws.

No estimate of a people's health can be complete which ignores the atmospheric and telluric conditions under which they live, yet how few and fragmentary even in England are the records from which any reliable conclusions can be drawn. A medico-meteorological map of the country is an impossibility at the present time, and so little is known with certainty of the combined effect of any given climatic conditions, that the vegetation, in the absence of personal experience, will be found a more trustworthy guide to the character of a climate than any data obtained from instrumental or artificial sources.

The medical man is constantly reminded of the influence of weather in the persons of his patients, those accurate "body-ometers," as Sir Humphrey Davy used to call them, yet he is unable to pronounce with certainty whether the effect is due to reduced barometric pressure, excess of ozone, preponderance of positive or negative electricity, increased or diminished humidity. The epidemic condition of seasons is a fact even now but ill understood, and the terms relaxing and bracing, loosely used to denote the moisture or dryness of the air, are probably the expression of more factors than one. It is only by accurate local observation, spread over long periods, that the relations of climatic changes to disease can be fully ascertained. Mr. Symons has shown what may

be done for one special branch (the rainfall) by untiring zeal and devotion; and a nucleus for more extended observation exists in the meteorological tables from fourteen large towns, furnished weekly by Mr. Glaisher to the Registrar General, in the reports from distant stations recorded daily in the *Times*, and in the weekly publication of returns from twelve scattered localities, in the pages of the *British Medical Journal*.

Air.—Intimately connected with climate is the air we breathe. Fresh air is a necessity of life, a first condition of health; but town air is no longer the purifying, life-giving body which is met with on the down or the mountain top. Its ozone is exhausted, it is laden with poisons from multitudinous chimneys, and a dense crowd of organic impurities are revealed by the microscope or the transient sunbeam. In the courts and alleys it does not improve; it is worse still in the workshop or the crowded garret, where ventilation is ignored and the laws of cubic space unknown.

The recent revelations in a metropolitan workhouse will be fresh in the memory, and are alone sufficient to prove the reckless disregard which exists, even in public buildings, of ventilation and the most ordinary laws of health. Legislation has done little, private benevolence and teaching much, towards a mitigation of the evils under consideration.

Open parks have been provided as lungs for our great manufacturing centres, dense neighbourhoods have been opened up, and well-constructed buildings erected for the labouring poor, but much still remains to be done so long as back-to-back houses and ill-paved courts exist in our provincial towns, and unsanitary workshops are allowed to sow the seeds of phthisis, which bear fruit eventually in an exaggerated death-rate and a progressive degeneration of race.

Water.—Next in importance to air, and equally with it a necessity of life and a condition of health, is water. "Speaking of considerable populations," remarks Dr. Gairdner, "we may say in general terms that civilisation, virtue, religion, the control of the passions, the cultivation of the higher emotions, all things that are implied in love to God and love to man, become practically unattainable wherever we cannot attain to pure air and pure water." They are man's right, and no change of place should make them inaccessible. Not only a wholesome supply for drinking, but baths and wash-houses should in every town be within the reach of the very poor. Dirt and disease are inseparable, and it should be a lasting disgrace to the community that renders both inevitable by a water supply which is either impure or insufficient for the wants of the population.

The source of water supply is perhaps the most momentous problem which a town's population can have to solve, and it has acquired still greater importance from recent investigations respecting the spread of disease; yet not only the source, but the quantity, distribution, and even quality of the water, are not unfrequently in the hands of those whose interests are not those of the consumers. A trading monopoly under our present law may decimate by cholera and diarrhœa, may degrade in filth and depravity, the poor of a town, which in cruel mockery they are said to serve. On the subject of purity much difference of opinion still unhappily exists. What amount of impurity, what amount of animal pollution, if any, can be consumed with safety? Does filtration, does exposure to air in the river's course, convert a sewage-laden water into a wholesome drink? are questions still seething in the crucibles of rival chemists,—questions which it may yet be that the physiologist will be called upon to decide. Low levels will receive the drainage from higher parts and of streets as well. Sewers will leak or get blocked, old cesspools are never in repair, yet pumps are still used, with approval from the higher powers, in the densest quarters of our towns, and, as might be expected, are the fruitful source of typhoid and choleraic disease.

Sewage.—"Is industry free to tumble out whatever horror of refuse it may have arrived at into the nearest crystal brook, regardless of gods and men, and little fishes; is free industry free to convert all our rivers into Acherontic sewers; England generally into a roaring sooty smith's forge?" exclaims a well known modern writer, and with reason; but an indignant protest is one thing, and a practical remedy for the evils declaimed against another. "It is ours to use air and water," says Dr. Gairdner, "and then to pass them on; but woe to the man or the community that detains or imprisons these, his servants of the hour, in their further execution of God's endless work." The danger is now too well known to be commented upon, and it is not going too far to say that for England the disposal of sewage is the sanitary question of the day. River pollution has assumed such gigantic proportions that the country has demanded, as with one voice, that it shall cease; yet the difficulties—sanitary, engineering and agricultural—in the way of change are appalling; so great indeed that they have led thinking men to go back once more to the first rudiments of sanitary science, there, haply, to find wisdom and the right way. Towns are pledged by the expenditure of thousands to drains and sewers, with all the evils attendant on the water carriage system; and much opposition might naturally be expected to any plan which was in any degree to supersede its use.

No single system, however, can be expected to accommodate itself to the outfall, the soil, and the topographical as well as social conditions of each several centre of population.

Irrigation, tanks for deodorisation and the manufacture of manure, the Milan cesspool system, the separation of rain water from sewage (*Menzies*), and other plans—all have their enthusiastic advocates, and some are justified by undeniable success; but the proposal of the Rev. H. Moule, to arrest and deodorise at once the source of all the difficulty by means of dry earth, whilst the storm and the drain waters are told off to replenish the earth and the rivers, appears at once so simple, and has already by its signal successes—often under trying circumstances—in India and in England, gained converts so many and so influential, that it deserves, as it will undoubtedly obtain, the greatest consideration in any solution of the problem now before the country.

Drainage.—Drainage, though closely allied to sewage, has its very distinct purposes in the economy of health; and though the latter may be the most pressing, the former is equally important in the removal of unsanitary conditions. Whole tracts of country, once depopulated by malaria, are now freed from this pest by proper drainage and cultivation. The recent investigations of Dr. George Buchanan* are conclusive as to the effect which drainage, wherever carried out, has had in diminishing the mortality from phthisis; and they not unnaturally connect themselves with the theories propounded by Professor Pettenkofer, of Munich, as to the influence of subsoil water (Grund-Wasser), in its ebb and flow, on the occurrence and course of epidemic disease,—theories which are rapidly gaining ground, and which no officer in charge of public health could now venture to ignore or neglect. Yet the broad acres of the upper Thames valley and other parts of England are still kept soaked and flooded for months in every year by an insufficient or obstructed outfall; and the drainage of towns is to this day neglected or imperfectly carried out.

The drainage of a town, however, may be complete, and yet, if the house drains are untrapped or out of repair, the results are no less disastrous.

Indeed the more perfect, and the more impervious are the sewers, the greater the danger from the admission of typhoid and other poisons to our dwellings through every unguarded avenue in the drains which communicate with them. The facts bearing on this subject are innumerable, and a small pamphlet by Dr. Carpenter, of

* Report of Medical Officer, Privy Council, for 1867.

Croydon, called "Hints on House Drainage," may be mentioned as giving in the smallest compass such information on the subject as every householder should possess and ponder, if he values the health of his family and those under his roof.

NUISANCES.—"*Honestè vivere, alterum non lædere, suum cuique tribuere,*" are, according to Justinian, the foundations of all law. They are the principles for which all Englishmen contend under the simpler and more comprehensive term of "fair play." Yet how frequently are they lost sight of in the pursuit of wealth, or in the sterner battle for life among our poorer populations. Numerous Nuisance Removal Acts have been passed, first in 1845, under apprehension of an approaching epidemic of cholera, again in 1848 and 1849, the whole being consolidated in 1855, and yet the definition of a nuisance seems as far off as ever.

The stench from a tallow factory or other offensive trade may pervade whole districts of a town and sicken all within its reach. Pigsties may exist in back courts and alleys, may poison wells with impunity, and be the bane of a whole neighbourhood. Slaughter houses may remain in the very centre of the cleanest (?) towns, unnoticed, perhaps, but none the less dangerous; and yet if no actual case of acute disease can be attributed to them, if not offensive to the eyes or nose of the inspector (appointed most frequently without other qualification than that of being right in politics), they are no nuisance in the eye of the law, and may continue unchecked in their silent work of sapping at their very foundations the health and strength of the people.

OVER-CROWDING.—There is perhaps no more fertile source of nuisances, dirt, foul water, and all the insanitary conditions which lead to disease, than over-crowding, in its double aspect of over-stocked houses and density of population on limited areas of ground. Dr. Hunter's able Reports to the Medical Officer of Privy Council* have proved that the evils of over-crowding in houses are by no means confined to town courts and alleys; they have shown that the shameful disregard of decency, the utter banishment of privacy, with results too hideous to relate,† are to be found in country villages, where all around speaks but of purity and comfort and peace; that the deathrates of hamlets and rural districts are increased by the growing tendency in many parts of England to

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* Seventh and Eighth Reports of Medical Officer of Privy Council, for 1864-5.

† Dr. Letheby, in one of his Reports to the Commissioners of Sewers for London, mentions as the result of actual inspection, "That 1989 rooms, ill-drained and ill-ventilated, contained no less than 5791 inmates belonging to 1576 separate families."

banish the agricultural labourer from the land he tills by day, to the neighbouring village for his home and his rest by night.

That mortality increases directly as the density of population, is now well nigh an axiom in sanitary science; it is as true of town areas as of the single homestead. "The prevalence of fever (typhus)," says Dr. Duncan, in one of his valuable reports on the health of Liverpool, "bears a general relation to the character of the courts, the state of the sewerage, and the *density* of the population."

The great movements of population, as shown by Dr. Bridges,* in one of the most philosophical essays ever written on public health, and still more fully by Dr. Morgan,† is from the rural districts inwards on the great centres of industry. During the ten years intervening between the census of 1851 and that of 1861, the country districts added but 3·9 per cent. to their population, whilst the addition to the great cities was 17 per cent. In 1811 the metropolis alone contained a population exceeding 100,000; there were twelve towns with that number in 1861, and they contained a quarter of the people of England. The rural populations, therefore, which represent the reserve stock of health and strength in the country, are being slowly but surely drained to supply the reckless wear and tear of our great cities; whilst the consequences are too apparent in the increase of intemperance, the growth of immorality, the gradual loss of stamina among the poor, and an excessive mortality.

E. T. Wilson, M.B.

[to be continued.]

* "The Influence of Civilisation on Health," by J. H. Bridges, M.D., *Fortnightly Review*, August 1st, 1869.

† "The Danger of Deterioration of Race from the too Rapid Increase of Great Cities," by T. E. Morgan, M.D. Pamphlet, Longmans, 1866.

HOW TO COOK AUSTRALIAN MEAT.

For some years it has been evident to those interested in the subject of the supply of food to the people, that the high price of meat in this country, and the probability of that high price not only being maintained, but increased, renders some action necessary to supplement the home supply, by importation of meat either raw, cooked, or preserved. *Whence* this supply might be obtained, was a question easily settled. The plains of Australia and South America are covered with countless flocks and herds sufficient to feed half Europe. *How* it could be made available was a far more difficult question to answer; and one which, at the present time, notwithstanding many experiments, cannot be said to be satisfactorily answered, though a great advance in the direction of a settlement has been made. It is not within the province of this article to discuss the various efforts to render available for use in England the animal food that is rotting for lack of consumers on the Australian plains. It is, however, necessary to refer to them in order to lead up to the subject to which it is more particularly desired to draw attention, viz., the aid that judicious cooking in this country may give towards making the supply of Australian and other preserved foods available for every-day use.

The first step that had to be solved was the possibility of importing into this country meat, uncooked and in carcase, that should be able to compete with the meat on our butchers' stalls. This must be the aim of everyone working in the matter, and anything short of this will do but little towards affecting the present state of the meat market in England. The Society of Arts, through its Food Committee, has worked energetically on this point, and, by its suggestions and its encouragement, has afforded practical men an opportunity, not only of experimenting, but of testing and comparing results; and these results, whether successful or unsuccessful, it has wisely treated as stepping stones towards something better. In whatever form the meat comes from Australia and other places, it is at all events perfectly new, and unlike what we are accustomed to cook or eat. This will probably be the case for a considerable time; and, therefore, the question of treating it so as to make it most useful may very fairly claim our attention. Take for instance the

tins of preserved beef or mutton, either roast or boiled, which contain good, wholesome, fresh meat free from bone, though generally with a superabundance of fat, or, to use a homely word, "dripping." Now, this meat when turned out of the tin presents an appearance totally unlike anything of the kind in England. Though it is said to be ready cooked, and fit for immediate eating, it is a matter of doubt whether it is very appetising to anyone seeing it for the first time.

Suppose that a working-man, tempted by the idea of getting six pounds of cooked meat without bone at a cost of sevenpence a pound, or about threehalfpence less than what meat bought in a butcher's shop would cost him, buys a tin for his Sunday dinner, what would be his feelings on his wife's setting before him the contents of the tin as she would turn it out? The first impression would be that he had been taken in, and his immediate resolve would be to buy home-fed meat for the future, even at a greater cost. Supposing, moreover, that scraping away the outside fat and glutinous matter, he musters up courage to attack the solid meat, he finds it, if his experience is the same as ours, pleasant and juicy to the taste, though stringy and fibrous, and having generally the characteristics of being overdone. His natural British prejudices will have been strengthened; he looks upon those who advised him to invest his money in Australian meat as little better than swindlers; and is not slow to proclaim the fact that he has been "humbugged." His complaint would be by no means unjustifiable, for the meat out of the tins is undoubtedly stringy, greasy, and flat, if such a word can be applied.

Two very important questions here present themselves,—first, can any improvement be made in the manner of preserving on the *other* side of the water? and, secondly, can anything be done *here*, within the compass and capabilities of a working-man's wife, to prepare the meat when taken out of the tin so as to make it palatable, and approaching what we are accustomed to see upon our tables? I have drawn my own conclusions as to the first point, but will leave them to be dealt with hereafter. With regard to the second question, I took six pounds of undeniably good meat, to see what I could do towards making it fit for the table. My own cook, and the cooks of several of my friends, had tried, or pretended to try, some "speriments" as they called them; but their unvariable success was—failure; and the messes they sent up as the result of their manipulations were something too dreadful to contemplate, much less to taste. Forgetting that the meat was already cooked, it was put on to stew till it shred into fibres that looked like strings

of brown vermicelli. It was, therefore, clear that nothing was to be made out of that process. Determined, however, to persevere in the matter, and believing that the absence of both ignorance and prejudice would materially increase the chances of success, I resolved to take the matter in hand myself.

The conclusion arrived at was, that as boiling was of little use, roasting should be tried. Opening a tin of preserved beef, which stated on the outside that it was "Tindal's," already cooked, and imported from Australia into England by Messrs, McCall, I turned the whole contents into a large dish. Carefully scraping off with a wooden spoon all the fat and gravy from the block of beef, which seemed, as far as I could make out, to be the under-cut of a large sirloin, I tied it tightly round with string, putting a piece of the solid fat in the centre, much in the same manner as rolled beef is tied, the only difference being that I tied it very tight. I then hung it as if it were a fresh joint to be roasted, before a bright and clear fire, giving it a slight sprinkle of flour all over after it was hung. Separating as well as I could the congealed gravy from the mass of grease that had surrounded the meat, I placed it in the dripping-pan, and, at intervals of a few minutes, basted with it the turning joint. In less than twenty minutes, the savoury smell that filled the kitchen convinced me that, so far, my experiment was succeeding. In half-an-hour, the meat having become well browned by the brisk heat, I took it down. Pouring off the dripping out of the pan, I made a rich, brown gravy in the ordinary way, by the addition of a little flour and water to what remained; and having served up the joint, with proper vegetables, I sat down to a *bona fide* dinner. Expectantly I watched the first slice cut off; the knife passed through the meat cleanly and easily; the second, third, and fourth slices came off equally well, and, to my great delight, I found that one fault had been cured—the meat was no longer stringy, but firm and compact. Tasting what I had on my plate, I found it all I could desire. I do not pretend to say that it was equal in flavour to the finest Scotch beef, and I think I know the reason why, as I shall show another time; but it was tasteful, agreeable, and even rich, almost melting in the mouth; and in all respects equal, if not superior, to second-rate English beef. Gratified beyond measure at the success of my effort, I proceeded to deal with the grease that I had scraped off the meat. Placing it in the hot dripping-pan, I let it gradually melt, and then I poured it into a large yellow basin, holding about a pint (which it quite filled), and let it cool. The next day, finding that there was about a cupful of gravy underneath, I had some Suffolk dumplings made to eat with it, and precede the

cold joint, and I found it rich enough to bear a teaspoonful of hot water. The meat was even better cold than hot, and cut cleanly; it seemed more consolidated, and to have improved in flavour. Congratulating myself upon the results I had achieved, my eye fell on the basin of rich, yellow fat I had strained off. I know that "dripping" is regarded as a luxury by the family of a working-man, for butter is not an article of which his children get much. Spreading some, therefore, on a slice of toast, I pushed my experiment to the extreme, with a happy result. The fat tasted marrowy and sweet, and was perfectly wholesome, and free from any trace of rancid oil.

Thus ended my first experiment. I have made others since then, but they must be reserved for a future telling. By way of conclusion, let me say that nine meals were made off the meat, which, with firing, flour, puddings, vegetables, cost 4*s.* 10*d.*; from which deduct the value of a pound of best dripping, value 6*d.* This gives the cost of each meal as—sixpence.

ANNE ISABELLA LARKINS.

FOOD AND THE ANGLO-FRENCH TREATY.

FORTUNATELY not many articles of food labour under protection, but the influence of commercial treaties is felt even on products which are not taxed at all. Increased intercourse naturally produces effects collaterally as well as directly; the larger the dealings between France and England in iron, in tissues, or in objects of art, the larger become the general acquaintance, and the dealings between the two countries. They become, consequently, better neighbours.

It is not every one who is aware of the extent to which we are indebted to our neighbours across the channel for food, and as the *Exposé* of the situation of the French Empire is just published, we extract a few lines from that very voluminous document, which includes comparative tables of the imports and exports for the first eight months of 1868 and 1869, converting both quantities and values into English equivalents.

Exports from France to England.

		Quantities.		Value in pounds sterling.	
		1869.	1868.	1869.	1868.
Live Animals	No.	54,784	24,929	581,560	200,060
Fresh and Salt Meat	Tons	659	748	50,960	57,000
Eggs	,,	21,468	19,675	1,030,440	944,400
Butter	,,	15,360	12,043	1,538,440	1,206,840
Fish, pickled or in oil	,,	933	nil.	61,200	nil.
Cereals	,,	60,993	23,927	596,280	208,960
Potatoes	,,	41,000	40,576	95,320	97,400
Vegetables, dry and reduced to flour	,,	2,750	2,711	41,800	41,200
Dessert Fruits	,,	7,085	10,524	193,080	280,320
Nuts, etc.	,,	1,112	864	71,160	55,320
Sugar, raw and refined	,,	25,819	25,981	674,720	637,560
Totals				4,934,960	3,729,060

Here we find an increase last year at the rate, in round numbers, of more than £560,000 on the item of live animals, of £480,000 on butter, and of £120,000 on eggs; with no diminution of importance on any article but fruit. Cereals may be taken separately, as depending upon the state of the harvests of the two countries, and not upon any alteration in ordinary supply and demand.

England is not in a position to supply France with much in the alimentary line, but her account is still worthy of notice.

Importations from the United Kingdom into France.

		Quantities.		Value in pounds sterling.	
		1869.	1868.	1869.	1868.
Fish	Tons	1,214	881	49,080	33,920
Oysters	No.	19,000	26,000	59,480	79,960
Cereals	Tons	90	19,700	1,020	244,160
Rice	„	4,077	5,484	68,480	92,120
Coffee	„	5,353	5,429	299,760	304,000
			Totals	477,820	754,160

Deducting cereals, though we ought perhaps to do the same with rice as affected by corn, we find on this account but a trifling decrease. The grand fact is, that we are now doing a business with France for articles of food to the extent of at least eight millions sterling per annum! What an amount of movement on sea and land, what ships, what horses, what men, women, and children, must such a trade employ, what necessaries and what comforts must it carry into homes on both sides of the channel, and how it must increase the interest that both parties have in remaining friends, and exchanging coffee for sugar, instead of less agreeable substances. It must be added, that the above figures do not represent the whole of the food trade, but only such articles as amounted individually to a million of francs, or £40,000, in the eight months; the unenumerated articles in the two accounts, reach very nearly forty millions of francs, a fair proportion of which doubtless consists of food. English ham, bacon, tongues, cheese, pickles, sauces, biscuits, and many other articles are now to be found in almost every important town in France, from Calais to Marseilles.

G. W. Yapp.

MARKETING THREE HUNDRED YEARS AGO.

The art of marketing, like many other useful and old-fashioned customs, is nearly extinct, and if it exists at all, it is only in some little country town to which railways have not yet penetrated, and where local boards of health and inspectors are unknown. In these primitive sleepy hollows (and there are still a few left) the country people meet once a week, not in a bran new market house, with iron railings and an elaborate drinking fountain, but *sub jove* as their fathers did before them, when the same provincial dialect is heard, and probably the same local jokes and proverbs as went the round a hundred years ago.

One feature, however, has certainly not died out, and that is the spirit of bargaining, which is half the fun of the fair, and which appears to be indigenous to the market woman, and, to a great extent, to the customer. Young ladies of the present day, if they ever did such a thing as go to market, would probably pay down what was demanded without cavil; but our grandmothers would have scorned the action. It was perfectly understood on both sides that the beating down was a part of the performance, and if a few personalities could be delicately introduced, so much the better.

Market day in the country, however, was not only the great gossip day which had to last the whole of the week, but was the only opportunity which housekeepers had to lay in their stores of meat, poultry, eggs, and such like perishable commodities. Now-a-days, the number of shops opened in the smallest towns has very much curtailed the general business, which nearly three hundred years ago was a serious affair, as the following bill will show; it is that of a gentleman's household in 1600:—

To a chine of Beef weighing 12 stone	£0	18	0
Twelve Neats' Tongues	0	12	0
Two dry Neats' Tongues	0	4	0
Leg of Mutton	0	1	10
Nine Capons	1	2	0
Ten good Wits (probably Plovers)	0	8	0
Six House Pigeons	0	4	4
Eighteen Felde Pigeons	0	4	6
Six Rabbits	0	4	2

Half a hundred Eggs	0	2	0
One pottle of fresh Oysters	0	3	0
Two Colleyfloreys	0	3	0
Thirty Lettes	0	0	4
Sixteen Artichokes	0	3	4
Nineteen Oranges and four Lemons	0	1	2
Pineapple Seeds	0	0	9
Orangades, 2 lbs.	0	3	4
Lump Sugar, 9 lbs.	0	9	0
Nutmegs, 7 ozs.	0	1	9
Synnamon, 1 oz.	0	0	4
Eight gallons Claret	0	16	0
Five pints Carraway	0	2	6
Three quarts Sherry	0	2	0
Three quarts Whight Wine	0	2	6
Butter, 30 lbs.	0	15	0
Eight bushels Wheat	0	2	0
Two hogsheads Beer	1	4	0

In looking over these items, we are struck with the excessive cheapness of some articles as compared with others, although it must be remembered that money in those days was dearer, and that population was scanty, and, therefore, there was but little demand. For instance, beef is priced at something over 1½*d.* per lb., and mutton about 2*d.* In the sixteenth century the legislature took a very active part in regulating the price of provisions, although it was soon found that such interference became practically a serious evil. The preamble of this act of 1532 is curious. It states "that dearth and scarcetie of good, cheape, and plentie of cheese, butter, capons, hens, chickens, and other victuals necessary for man's sustenance, happeneth, riseth, and chanceth of so many and divers occasions, that it is very hard and difficult to put any certaine prices to any such things; and yet, neverthelesse, the prices of such victuals be many times enhansed and raised, by the greedie covetousenesse and appetites of the owners of such victuals, by occasion of ingrossing and repeating the same, more than upon any reasonable or just ground or cause, to the great damage and impoverishing of the king's subjects." By a proclamation of Henry VIII. the butchers of London were empowered to sell as follows:—Beef and pork at 1½*d.* per lb., mutton and veal at ¾*d.* per lb. This tariff was altered soon afterwards to:—Beef not to exceed ⅝*d.* per lb., mutton 1*d.*, veal 1*d.* per lb. Lamb, however, was a luxury, for best lamb was 2*s.* per lb., second lamb 1*s.* 8*d.*, and meanest lamb 1*s.* 4*d.*

Eggs at 2*s.* the half hundred cannot be considered dear, though they were considerably cheaper some seventy years previous to this date, when Henry VIII. rooted out the monasteries. There is a curious old Percy ballad extant which imputes all the evils of

dear provisions to this measure. It is written in broad Somersetshire dialect:—

"Chill tell thee what, good vellowe,
Before the vriers went hence,
A bushel of the best wheate
Was zold vor vorteen pence;
And vorty egges a penny,
That were both good and newe."

Nor can it be wondered at that they were so cheap, seeing that in the previous century a hen was only 3½*d.*, and a goose 3*d.*

Perhaps the most extravagant prices in the marketing bill are those of cauliflowers (colleyfloreys) and artichokes, but they had only just been introduced and were considered as great rarities, which, in a general way, were only found on royal or noble tables. Potatoes were equally considered as delicacies, not to be obtained by the vulgar herd. The same thing may be said of the sugar, which at 1*s.* per lb. would not be in general use. As early as the fourteenth century it is mentioned, but only as a luxury, which it continued to be down to the reign of King James.

The fishmonger's bill in those early times was even smaller than the butcher's or the vintner's. A list of prices put forth in 1274 tells us that a plaice cost 1½*d.*, twelve soles 3*d.*, mullet 2*d.*, conger eel 1*s.*, turbot 6*d.*, dorae, 5*d.*, mackerel ½*d.*, (though in Lent they rose to 1*d.*,) twenty pickled herrings 1*d.*, twenty-five eels 2*d.*, 100 smelts 1*d.* Surely with such prices as these, Friday ought to have come every day in the week, and a fish dinner could be supplied at a considerably lower rate than one gets it even at Simpson's.

THE WINES AND BRANDIES OF LANGUEDOC.

Languedoc is the name of an ancient province of France, and comprises the essential parts of what are now the departments of the Aude, of the Hérault, and of a portion of the Gard. The wines of this district are rich in colour and distinguished by much body and spirituosity. This spirituosity is, however, exaggerated by report, for the inspector who was sent by the English Board of Customs to obtain specimens of natural wines in this district, furnished none that contained above 23·9 per cent. of proof spirit. In a great part of the Languedoc, viticulture was already in a flourishing condition at the time of the Romans, and this part still continues to uphold its ancient reputation. The wines of Languedoc are the objects of a vast commerce which is daily increasing, owing to the circumstance that no country can compete with the united advantages of climate, soil, and situation, by means of which great quantities of cheap and saleable wines are produced. The surface occupied by vineyards in the three departments mentioned comprises 258,192 hectares, of which there are in the department of the Aude 70,982 hectares; in that of the Hérault 115,962; and in that of the Gard 75,248 hectares. The soil is essentially the same in the whole of this viticultural district, chalky on the slopes, chalky and clayey in the plains, and silico-calcareous and mixed with more or less rolled pebbles on the high plains or plateaus. Correspondingly the same vines are raised throughout the whole of these departments, and the wines which are obtained from them are classified in the same manner throughout the entire province of Languedoc. They generally go under the name of "Vins du Midi," which in the eyes of many ignorant persons is equivalent to cheap, bad stuff. If they knew the quantities of this wine exported to all parts of France, and mixed with the Burgundies, the Bordeaux, and other varieties of French wine drunk in the country or exported, they would moderate their dislike; and if they had the enterprise to study the wines of those countries themselves, they would see that just for the sake of their quality and cheapness they deserve to be well known in all parts of Europe, and to be at the door of every consumer.

The wines of the Midi are divided into two categories—wines for the distillery and wines of commerce. These latter are subdivided

—first, into ordinary red and white wines of commerce; secondly, into the fine red wines; and thirdly, into the white dry wines, and into the white liqueur and muscat wines. The sales are effected through the instrumentality of brokers, or courtiers so called. Formerly the agents used to taste the wines and played a great *rôle* in affairs, but now-a-days their only office is to obtain samples and bring them to the merchants. If a merchant likes a sample he goes to the repository where the wine is lying, and identifies it with the sample. Many transactions are also carried on between the producers and the merchants directly.

The cultivated vines are the carignane, the terret noir, the grenache, the mourastel, the espiran, the œillade and its variety, the sinsaou, the black pic-poule, the white pic-poule, and the clairette—these yield the wines of commerce. For the distillery wines only two plants are cultivated, the aramon and the terret bourret. These two vines cover the whole of the plains of the Hérault and of St. Guilhem-upon-the-Sea, the plains of Lunel, of Orbe, and a part of that of the Aude, to the very borders of that department.

The Terret Noir is recognised by its long bunches and closely set nodes. Its leaves are equal in length and breadth, and show five lobes, of which the two nearest to the leaf-stalk are very deeply cut out; the bunch is pyramidal and winged, and has loosely hanging grapes, which are of equal size, oval, blackish red, transparent and browned by the sun, so that they appear almost bluish grey; they have an acidulous taste and a thick skin.

The Terret Bourret has vigorous brown coloured canes, and middle sized leaves, which are wider than they are long. The bunch is pyramidal, always has large wings, and bears oval grapes of a light rosy or violet colour, and covered with brownish specks. The grapes have a flat taste, in consequence of which they yield only the lowest wines used for the distilleries.

The Aramon is also called the rich plant. It has a very vigorous stalk, and the bays of its leaves are very little cut out; the bunch is exuberant, long; the grapes are round, equal, violet black, bloomy, of a flat taste, and provided with a thick skin.

The Œillade has cinnamon coloured canes, large leaves, and a magnificient pyramidal winged bunch with voluminous grapes, which are hung up to very long green stalks. Their colour is blackish blue; there are brown sun spots on them. Their taste is fresh, sugary and very agreeable. They ripen early.

The Piran, or Aspiran, has leaves, the five divisions of which are deeply cut out. The bunch is middle-sized, and bears black greatly

bloomed grapes. Their taste is fine and sugary, their skin thick; they mature early.

The white wines are mostly made of Pic-poule and Clairette. It is almost impossible to say what may be the proportion of these vines in each vineyard. The vines which are planted on the alluvial flat soils are called "vines of the plain." The less fructiferous soils of the alluvium consist of rolled pebbles mixed with earth containing oxide of iron. The vines growing there are called "vines of the terrains de grès," and give esteemed commercial wines. The vines of the slopes, called "garrigues," yield wines fit for exportation, and are distilled only in years of plentiful harvest. The distillery is in fact the adjustment apparatus which keeps up the prices in abundant years. In years of dearth, on the contrary, even the wines of the plain, which ordinarily go to the distillery, are bought up by merchants, mixed with good-bodied wines of good years, and sold to the world. These proceedings are very useful to the proprietors and merchants, but very unsatisfactory to the consumers.

MAR 19

The cultivation of the vines is not very carefully performed here. The vine is planted, as everywhere, by means of blind canes, and grows easily. Only in the Gard are there districts in which human labour is exclusively employed. On the gentle slopes, and in the gravelly soils the plough is used. Wherever this is the case the feet of the vines are, however, dressed by hand. Manuring is vigorously kept up. In the winter a hole is dug round each vine, the manure is put in and the earth covered over it. This extraordinary proceeding, which I have also seen practised in the graves of the Haut Brion district, indicates great vitality of the vine. The vines in the Rhenish countries are believed not to bear such treatment, and in the Champagne the vines are also manured in such a way that the manure does not come in contact with the feet of the vine itself. The cutting of the vine is generally regulated so that each plant may have from four to six branches, on each of which a spur of two eyes of one cane is left. When the soil is less fertile only three branches are grown. The vines are now mostly cut with the *sécateur*, a kind of strong scissors, instead of, as formerly, with the sickle-shaped garden knife. The vintage takes place in the middle of September, and extends sometimes into October. In the rich alluvial plains 200 hectolitres of distillery wine are sometimes obtained upon one hectare, but upon the slopes and in the gravel the vines give on an average not more than 25 to 30 hectolitres per hectare. In certain good ordinary soils planted with fine vines, in the mixture of which there is a certain

proportion of the aramon and the terret bourret, 50 hectolitres per hectare are sometimes obtained.

The grapes are trodden with the feet, or mashed with machines consisting of revolving cylinders. They are ordinarily powdered over with plaster of Paris, and then put into the vats. The wine is put into *foudres* or large barrels of a capacity varying from 7 to 700 hectolitres. These are filled from below by means of pressure pumps. The wine is racked in February or March, and a second time before the next vintage, when it is desired to keep it.

The following are the more distinguished growths of the several departments. The vineyard of Limoux, having an extent of 688 hectares, yields annually 3000 hectolitres of a white wine, known under the name of "Blanquette de Limoux," and 10,000 hectolitres of red wine. The white wine fetches double the price of the red.

In the Gard we find the three remarkable growths of Ledenon, Langlade, and St. Gilles. The vineyards are situated in the arrondissement of Nîsmes. The *Langlade* wine is perhaps the best known. It is left only three days in the vat. It is light, of rich colour, and fine, and less alcoholic than the other wines. It is grown on chalky soil, and under its name thousands of barrels of wine grown on neighbouring plantations are sold. St. Gilles has a vineyard of 5000 hectares. Its wines have a brilliant purple colour, are soft, have much body, strength, and what the French call "nerf" and "mordant." They are called "vins fermes," because they can be used to give colour, and strength, and body, to wines that do not possess these properties; and hence they are also called *vins de remède*. The St. Gilles wines bring, however, always a particular so-called "taste of *terroir*" into the wines with which they are mixed. I believe this taste to be the consequence of bad treatment; and that, if the wines of that vineyard were treated with such care as is bestowed upon the Roussillons and the Narbonnes, they would show nearly as much finesse as the wines of these districts. Considered as wines of dyeing faculty, the wines of this district are divided into six classes, and called accordingly wines of one, three, five or six colours, according to whether they can, on being made with one, three, five or six parts of white wine, produce a well-coloured ordinary table wine. By their means the wine merchants of Bordeaux colour the white wines of the Grâves, Blayais, and Libournais, and then export the product as red Bordeaux. At St. Gilles, wine is sold by the *baril*, which is a little more than 50 litres, and corresponds almost to the Austrian *Eimer*. The hectolitre may sell at 53 francs; and, in good years, may fall to 3 francs. The

average price of a hectolitre is 10 francs. Most of this wine goes to Paris and Holland.

The vinification in this district deserves a few particular remarks. The care taken to extract all the colouring matter from the husks is very great. Before the vintage is mashed, it is put into closed spaces, whereby a slight fermentation begins in the unbroken berries through which the skin is predisposed to part with its colouring matter. When this effect has been obtained, the grapes are trodden with the feet; but wooden shoes are mostly worn by the workpeople, and the mash is put into the vats for fermentation. And now comes the operation which, in my opinion, gives to all wine in this district its peculiar taste. The vintagers mount to a gallery round the top of the vats, and submerge the "chapeau" by means of long forks, and this is repeated until the husks are deprived of the greater part or all of their colouring matter. It is clear that in a district where the temperature at the time of fermentation is so high as in Languedoc, the upper parts of the chapeau pass into putrefaction, and, on being submerged, communicate their taste to the wine.

There are also wines obtained which, in ordinary years, remain of feeble alcoholicity; and, therefore, bear and require an addition of spirit. These are sometimes treated as follows:—The berries are put into a cauldron and heated, in order to macerate the hard skins, and allow the colouring matter in them to be extracted more easily. The grapes so treated are then put either into spirit or into new wine, and the tincture is used to colour or fortify other wine. Similar means have long been adopted by the manufacturers of wines in Oporto. The fermenting vats of the Languedoc are frequently, about twenty-four hours after the beginning of the fermentation, deprived of a portion of their wine, which has then only attained a dark rose colour. This wine is allowed to complete its fermentation in that state, and is then sent off to the Bourgogne to serve in what the French call the "arrangement" of the Burgundy wines.

A very careful method of making white wines prevails at St. Gilles. The must, after having been drawn, is put into barrels which have before been strongly sulphured; that is to say, the oxygen contained in their interior has been absorbed by the sulphur matches which have been burned in them. The must is now allowed to run into the cask, as much sulphur being burned from time to time as will entirely absorb all oxygen. The effect of this proceeding is, that the sulphurous acid contained in the cask absorbs all oxygen in the must; and as the latter is thus prevented

from acting upon the albuminous matter, fermentation does not take place. The must, therefore, deposits all its impurities at the bottom of the cask. After two or three days it may be drawn, and is then entirely clear. Of course very soon after, fermentation begins, but it is much slower, and leaves a great deal more sugar in the fluid than would otherwise be left. The wines of St. Gilles are most commonly used for the artificial production of "port" and "sherry," of which not a little is thus made in Xeres itself. There is also produced at St. Gilles a curiosity in the shape of wine called "Tokay-Princess." One Dr. Beaumes manufactures this wine from the true furmint or Tokay vine after the manner of Hungarian Tokay. This wine is sold in the place at 6 fr. the bottle, and belongs to those sugared curiosities which, at least in England and Germany, have gone out of use.

Amongst the remarkable growths of the Hérault, I have to mention St. Georges D'Orques, St. Chrystol, and St. Drezery. These three are for red wines. The Picardins are for white wines, and the Frontignans and Lunels are for muscat wines. I commend particularly the wines of the arrondissement of Montpellier as being among the finest of the department. I have tasted wines from good years four or five years old, which recalled to me many of the finest qualities of port. The wines of the Picardins are sweet or dry, and mostly obtained from the clairette. The grape of this vine does not mature before the 1st of October, and it is well to let it hang for a fortnight longer before vintaging it. The wines obtained from it have much similarity to Madeira, and they contain from 13 to 15·5 per cent. of absolute alcohol. They are frequently mixed with alcohol. If they are not dry enough, they are exposed to the sunshine in large barrels for some months, the manufacturers thus imitating the practice of the Spaniards, who also mature their wines in the sunshine, while in Madeira they lay them in hot chambers specially constructed.

The hectolitre of Picardins wine is ordinarily sold at from 12 to 16 fr. Sweet wines are here made by sulphuring the must, and allowing subsequent fermentation; which, if the wine is not very syrupy, is intercepted by the addition of spirit. Most of these wines are now used for imitating Spanish wines, such as Alicantes, Sherries, and Malagas.

J. L. W. Thudichum, M.D.

[TO BE CONTINUED.]

NOTES OF THE MONTH.

At a recent meeting of the Zoological Society, some food curiosities were illustrated by Mr. Andrew Murray, who laid before the members specimens of edibles sold in the markets of Old Calabar. Amongst them was a fruit-eating bat (*Pteropus*) ready trussed for cooking, a crustacean rare in naturalists eyes (*Callianassa Turnerana*), and the larva of a beetle found in the trunks of decayed palm trees.

The effort now being made to establish "cheap food" dinners for the working classes in the metropolis is deserving of the highest encouragement; and the scheme is so easy to carry out, that it is a wonder that it has not been put into execution before. Australian meat must evidently be the material from which the penny and twopenny dinners will be compounded, and looking at the crowds that may daily be seen dining off the soups and ragoûts in Norton Folgate, we believe that duplicates of Mr. Tallerman's establishment, dotted over the working centres of London, will do much to relieve the prevailing distress. An additional proof of the value of the meat has been very lately given by the Emperor of the French, who sent over for Mr. Tallerman, and minutely investigated the whole system, with a view to introducing it into the army. The Imperial verdict of approval was satisfactorily followed up by that of the soldiers, twenty out of twenty-five pronouncing it excellent, and even superior to some of their rations. Of the five who reserved their decision, the Emperor curtly remarked "that they had no appetite."

The Food Committee of the Society of Arts have lately had a field day of tasting experiments. The samples consisted of tinned meats from the Melbourne Preserving Company, including boiled mutton, boiled and spiced beef, together with a tin of raw meat preserved by Manning's process. There were also some French samples sent by Baron Fabrice, whose method of preparation consists in dipping the meat into some aromatic mixture, supposed

to contain tannin. Another mode, which likewise comes from France, is that of M. Thibierge, who immerses his joints in dilute sulphuric acid of the strength of one to ten. As far as chemical agents are concerned, sulphurous and sulphuric acids seem to be decided favourites.

The following culinary note on sausages is from the *Athenæum*:—"The earliest authority given in Todd's Johnson for 'sausage'—Richardson does not notice the word—is Baret's 'Alvearie,' 1580 A.D., 'a pudding called a sawsege.' Todd also says that the contents are 'stuffed into skins and sometimes only rolled in flour.' In this he is doubtless right, as early makers of sausages cannot all have had skins at hand to put them in. But these savoury edibles were made long before 1580, and were called 'weasels,' whose long thin bodies they resembled. A recipe for making these 'weasels' is given in the very curious 'Liber Cure Cocorum,' of about 1450 A.D., edited for the Philological Society by Mr. Richard Morris, in 1862; 'First, grind pork, temper it with eggs and powder of pepper and canel; close it in a capon's neck or a pig's paunch (or gut), roast it well, and then varnish it with batter of eggs and flour, to serve in hall or else in bower.' 'Haggis' was made in 1450 too, as the receipt for it follows that for 'weasels:' Sheeps' hearts, kidneys and bowels were boiled, chopped-up with parsley, hyssop, savory, suet, pepper and eggs,—with mint, thyme, and sage also in winter,—then boiled again, and sprinkled with salt.

Amongst the other contributions that Australia is sending to this country in the shape of food, we may soon expect a consignment of kangaroo sausages. At present the kangaroos and rabbits are a nuisance to the colonies, from their prodigious numbers. The flesh of the kangaroo is very palatable, and many of the settlers have determined on utilizing it by sending it to England properly smoked and seasoned, and thus converting what was a destructive pest into a positive gain. The rabbits are numbered by millions (one squatter alone having paid £5000 in the year for keeping them within bounds), and it has been suggested that they should be cleaned, preserved in sweet pickle, and packed in fat for exportation.

Barking must be the very paradise of dirt. According to Mr. Rawlinson's report, not only is the London sewage brought to its

door by the Thames, but it is the favourite port of importation for London muck, which is here unloaded to be taken into the country. In addition to this, the town itself, as though determined to show its own innate dirtiness, is unsewered, is full of cesspools, has a sewage-tainted subsoil, and a defective water supply. Barking also possesses a negative recommendation, in having nobody whatever whose business it is to look after it. Its motto should be "nobody knows and nobody cares."

THE Columbia Market in Shoreditch has not answered expectations as a meat market; and, so far, must have considerably disappointed the benevolent intentions of the founders. We trust, however, that this cloud over its prospects is very temporary, for by the end of this month it will be opened as a fish market (a great desideratum in London), for which its situation particularly qualifies it. Billingsgate is notoriously inadequate to the requirements of the metropolis, and this addition will be a welcome addition to the arrangements for supplying cheap and wholesome food for the working classes.

WE believe that the notion that Frenchmen live principally on frogs, is somewhat discredited in England at present; but the following would go to show that the creed of our grandfathers is not altogether without foundation even at the present day:—"The exportation of frogs to France," says the *Echo du Luxembourg*, "has developed considerably of late. A man named 'B.,' of Vance, has forwarded 200,000 in the last three weeks; on Thursday he sent off 30,000. They are chiefly sent to Rheims, Nancy, and Paris. A thousand frogs fetch 13fr. (10*s.* 6*d.*), and weigh 50 kilogrammes (1 cwt.). They enter France duty free. At Rheims 25 pairs of frogs' legs can be bought for sixty centimes (6*d.*). The thighs, as every one knows, make delicious joints (*des succulents rotis*) with white sauce and in a *fricassée*. They are thus a dish by no means to be despised. But the rest of the body, and the skin—the sticky, slimy skin—what is done with that? Why, they make turtle soup of it! Yes, that savoury *mork turfle* (*sic!*), over which the gourmands lick their lips, has for its chief foundation the animals which haunt the marshes and the fields of Luxembourg. The autumn and the spring are the best time of year for frogs."

THE

FOOD JOURNAL.

FOOD TASTING AND TESTING.

Some observation of the difficulties encountered by the introducers of Australian and other preserved meat, leads me to make a few remarks on tasting and testing, as there is reason to think that discouragement sometimes arises from misunderstanding. Nothing appears easier than to carry out such a duty; yet, when we come to see the practical application, considerable differences of opinion will arise. It is much the same with consumers as with professed judges, for, unless some fair standard is taken, dissatisfaction may be shown with a good article. I remember some years ago, when on the visiting committee of a large metropolitan hospital, where we were careful as to the provisions supplied, that all of a sudden there was much complaint of the food in two or three wards. As the same contractors supplied throughout, it appeared none the less unaccountable that the grumbling was not general. On attending at dinner time we found the food in the kitchen quite satisfactory, and such we heard was the opinion in some of the wards. At length we came to the scene of discontent, and we asked for grievances. We were told that the meat was not good. As some of the objectors were on low diet, it turned out that their real grievance was that they had no meat, which the doctors did not allow them. Then we confronted some of the others, who, mutton chop in hand, were forced to own that the meat was good. On being asked why they objected, they said it was on account of another patient, to whom we applied. His answer was, that the meat was not of prime quality; and, on being pressed, it turned out he was a journeyman butcher. He could not find any fault with the meat as good and sound, and such as respectable people ate in their own houses, but it was not high-priced meat. To this our answer was, that our duty was not to supply high-priced meat, which our patients did not get at home. I recommended the discharge of the grumbler at the

earliest possible time, and thereafter everything went on fairly. By placing an unfair standard, we must get an unsatisfactory judgment.

My own experience at the Food Committee of the Society of Arts is quite sufficient to make me distrustful of my own opinion; for the task is not a pleasant one, however inviting it may at first sight appear. To say nothing of the chance of an article being distasteful, it is not agreeable to spend one's time in tasting provisions, which are seldom offered as articles of luxury. Great banquets of Australian meat are apt to turn out delusions, because the visitors, like some of the squeamish guests at a horse-meat banquet, make up their minds to taste as little as they can, if even they taste at all, of the articles exhibited, reserving themselves for the ordinary articles of diet, washed down by sherry or champagne. Indeed, the host and the guest at some of these experimental entertainments are equally ludicrous examples of disappointment.

An inventor of a process, or importer of preserved meat, invites a number of gentlemen to lunch or dinner on joints or tins of meat, placing another haunch of fresh meat for comparison, with the usual accompaniments. To his dismay the choice article, which he triumphantly announces as having been kept for three or six months, and which he believes they are going to swallow as a *bonne bouche*, is indeed served out on plates; but not only is there no cut and come again, but he finds that after a bit has been chewed the meat is left untouched, while the haunch is worked down to the bone. What chance there is of his getting a fair testimonial under hand and seal he knows already pretty well, although some half compliments are paid to his preparations.

The guest may get on no better; and though some will of malice aforethought come with their lunch already under digestion, so that they may avoid eating, woe be to the amateur judge who comes conscientiously hungry, and hopes, at all events, to satisfy his appetite as some small compensation. He not only tastes his meat, but eats it, sometimes whether he likes it or no. As he sits down to table, a grave German chemist early gains his assent to certain preliminary propositions, the most successful specimen is unearthed, and our critic is favoured with three large slices. He puts a bit in his mouth, and would put it out, not altogether dubious of the flavour, did not three learned professors look upon him and await the expressions of his contentment. In despair he gets through the first slice, and obtains a lucky respite by asking to taste another dish of the preparation. The salakikabe of the ancients, recorded in Peregrine Pickle, or Don Quixote's balsam of Fierabras, as imbibed by Sancho Pancha, can be but a mild imitation of some o

the chemical flavours communicated by preparations to meat rather tainted; but a timid young man crams in much of the poison under the eyes of a warlike-looking Frenchman, who insists upon it that the meat is admirably preserved and of the most delicious flavour, and that when cold it will have no disagreeable taste, and may be kept for weeks, which it assuredly would be so far as the doomed experimentalist is concerned. He would leave off then, if he durst; and going home with a dread of indigestion, he is almost relieved when he feels a twinge of stomach-ache. In a cooler moment no German professor or French Count can extract from him a line of testimonial.

Such are some of the perils of food tasting, an avocation from which Brillat Savarin would have turned with loathing, and which in some of its experiences is not far removed from oil tasting, though without the pay.

If Australian preserved meat for the supply of the navy or working classes is to be tested, it must be tasted, and fairly compared. It is questionable whether most of the tribunals appealed to are competent. A man accustomed to middle class comfort and luxury has set before him a tin of preserved meat served up in some, to him, unknown form of cookery, such as a working-man's wife makes up often enough. Hence his prejudice is aroused that this can never turn out of consumption the beef and mutton of first rate west-end butchers. If he eats it he is none the better satisfied; but, as hinted, there are a great many people who never eat these experimental preparations. They make it a point not to eat them; they dine beforehand, or dine off the ordinary provisions on the table. Some of these people, more careful, even chew the already condemned meat over and over again in closed mouths, as they never do in their own houses; and it would be very hard if they do not succeed in finding some slight flavour which they think is not that of first-rate meat.

Before going any further, it is as well to point out that there are few persons in this country who have a fair taste, or even know what it is. The palates of many are vitiated by high-seasoning and by doctored wines, while the pitch of their appetites is set to one conventional standard. They know at the utmost the port wine or dry sherry flavour to which it is the fashion of their day to conform, but they do not go beyond. A sufficient proof of this weakness of taste is the rejection in this country of so many fine and delicate wines, and the restriction to certain set wines. Taste disease or imperfection, there can be little doubt, is at least as prevalent as colour-blindness, and more common than hardness of

hearing. The touch we know to be dulled with many, so that some doctors cannot feel the more delicate indications of the pulse; and even John Hunter suffered in this way. The taste is particularly affected after colds.

Thus there is a likelihood of some of the tribunal being so far incompetent for tasting, besides the chance of temporary derangement of the palate. There is no guarantee as yet against this. It is necessary that meat should be tasted without salt, condiments, or vegetables, to ascertain what flavour may attach to it of the chemical preparations; but of course this is no test of the alimentary value of any article. There are few men who can or will eat roast beef without salt, mustard, horseradish and vegetables, for that is not the way people live.

Meat, after this first test, must be eaten in the usual way with condiments, and this is perhaps the most practical test. In the preliminary trial there may be evidence of some slight acid or chemical taste, which does not show itself in the ordinary course of eating. If so, and if the chemical is not hurtful, there can be no reason against the use of the preparation. There can, however, be little doubt that many articles which would answer to this standard have been rejected or treated with little consideration.

There ought to be a question as to the after effects on the digestion; and where a variety of substances have been eaten, the precise cause cannot always be ascertained or determined. If, too, some effect be produced by a chemical, it may not be objectionable any more than that of vinegar or other condiments used by the workman in common course.

If the article to be examined is offered for purposes of luxury, then it must be determined by such standard; but, in ordinary cases, an inferiority in quality is not a ground for rejection or depreciation. Meat supplied from many countries of Europe is decidedly inferior to prime qualities of home production; but then these prime qualities go to the wealthy classes, and the working classes have to buy meat of far lower quality. Thus the foreign quality may really be admissible on a proper standard. The same remark applies to Australian meat. A healthy bullock or sheep is killed in the bush, and preserved. Of course, such beast has not been fattened with swedes or oil-cake, and will not yield prize meat. After all, the question may at the worst resolve itself into this, whether the article before us is not preferable to the costly though inferior meat which many of our people are forced to buy.

French cookery again is no reasonable preparation of specimens for consumption by English working-men; they do not keep

French cooks to imitate such dishes. A very fair test would be to get meat cooked by working-men's wives, and tasted by working-men. After all, as much depends on the cooking as on the eating. Articles which require a great deal of cooking are unsuited for the English working classes. In one or two rooms there is neither space nor appliance for long soaking or protracted cooking. The woman has to give this time to her children, to the washing, mending, and cleaning.

Whatever is an addition to the mass of food available for the people, is still, even if of inferior quality, so far acceptable. If the inferior beasts of Australia and the River Plate, which are there superabundant, can be made available for supplying meat here, by all means let it be done. This is an object to be encouraged and forwarded, and not to be discouraged. There are many articles already in use which have a peculiar flavour quite as much as preserved meat; and among acid substances may be named bacon, ham, and salt beef, to say nothing of pickled herrings and sardines, eaten with the pickle. By conscientiously recording a slight acid taste, or a sub-acid taste, or a slight flavour, the relative value of an article may be depreciated, and a suggestion given for the exertion of prejudice. A gentleman who will cheerfully eat a tin of preserved meat on a sea voyage, will on shore make out some plea for its not being a prime or acceptable article. Those to whom an article is truly acceptable, are those who cannot get anything at all so good.

Hyde Clarke, F.S.S.

Two works on mushrooms have recently appeared in Paris; one, by Dr. Cordier,* gives the history, description, mode of cultivation, use, etc., of all the mushrooms known in France, in full detail, with glossary of scientific and vulgar names, and is illustrated with sixty chromo-lithographic plates, representing more than one hundred species and varieties of mushrooms. The other, by M. Krænish-franck, botanist,† is a much smaller work, the principal object of which is to enable readers to distinguish the wholesome from the poisonous kinds of fungi; this also has coloured illustrations.

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* "Les Champignons de la France," etc., Rothschild, Paris.

† "Guide pour reconnaître les champignons comestibles du pays de France, etc.," E. Donnaud, Paris.

A FEAST ON WORMS.

Shakespeare asks, "Where is fancy bred; in the heart or in the head?" Without answering the question, we might certainly add that, to judge from what we are about to relate, it has no material connection with the gastronomic organs. If fancy and prejudice only keep neutral, there is no knowing what appetite may do. The stomach and the palate by themselves, uninfluenced through the mind, or rather its fancies, will truly stand anything that is not poisonous, painful, or, apart from its associations, absolutely nasty to the taste. We do not know whether such a divorce between fancy and the body has or has not its advantages. The French Society of Cultivators once sought to solve the point. In solemn conclave they voted a feast, at which a new dish should be the chief attraction. But what novelty could be found? Shall we say that, as savages love to consume their enemies, so these hardy agriculturists sought a palatable flavour in a fried worm? Certain it is that, two years ago, French agriculture was much plagued by worms, and the society chose the worm as the *piece de resistance* for their banquet. The choice of the species, however, was a matter of grave consideration; and only after much discussion the worm of the cockchafer was selected. This species had, by the way, proved itself the most injurious to the crops. It is known in France as the *ver blanc*, because of its dirty white colour, and rejoices in six legs. Adepts chose a few of the youngest and most tender, while the cooks wisely decreed that they should be thrown into vinegar and water. The immersion made them disgorge the earth which they had swallowed. When thus cleaned, they were rolled in a paste of milk and flour, so as to give them a brittle crust. This much accomplished, the worms were taken in triumph to the Café Corazza, in the Palais Royal. This was the house selected for the banquet; but the manager had little suspected what he would be told to place in his cherished frying-pan. However, the *chef* of this fashionable dining place performed his duty punctually, and just at the right moment the worms were brought up hot and crisp to the banquet. Two were placed on each plate, and it is boastfully recorded that those who ate one ate the other. But more; there were eighty guests and 200 worms, so, perhaps, some might have had three. May this be a lesson to the fastidious who are too fanciful. What may we not accomplish with strength of mind?

PUBLIC HEALTH.

PART II.

Food.—The whole subject of food, including drink and medicines, will be so fully dealt with in this journal, that it will be necessary to say but a few words in this place as to its bearing on the Public Health. The direct connection of drunkenness with insufficient food is now an acknowledged fact, but it is one cause amongst many; the adulterations of beer and spirits, according to the inexorable laws of "competition in business" (Hon. J. Bright), by which thirst is stimulated, but never quenched—and the tainted water supply which drives the working man from his home to the nearest public house, are no less potent in the causation of intemperance and its train of disease.

The adulterations of food are possibly less directly hurtful to health, and injure the morality of the seller only; but it would be difficult to estimate the influence on infant mortality of bread loaded with alum, milk from a diseased source, or diluted with water. In like manner it is hard to say what may be the direct ill consequences following the consumption of meat in any way tainted. Inspectors are often ignorant, often lax in their duties; and we know, from the evidence of Professsor Gamgee and Dr. Letheby, that quantities of meat from beasts which have died of pleuro-pneumonia and other diseases are consumed by the poor in our great cities; they come and buy, and it may be said of them, as of the juvenile consumers of fruit offal at Covent Garden Market, that "they not improbably in many cases slink home to die in their holes, as rats do. That they are never missed from the market is no proof to the contrary; their identification is next to impossible."*

Yet, the question is a vital one for the poor, and if the cheap joint is to be driven from the market, it must be by providing a substitute as cheap, and less hazardous to health and life. The problem thus connects itself with the soup kitchens, and all the various attempts which have been made, with varying success, to import food at little cost, which shall be wholesome, nutritious, and not unattractive in appearance, taste, or smell.

Turning to medicine, adulteration meets us even here; and the most stringent regulations, followed up by vigilant inspection, will be required if this, our sheet anchor in disease, is to do its part in the reduction of mortality, and in the improvement of Public

* "Seven Curses of London," by James Greenwood.

Health. The sale of poisons in the guise of quack remedies bearing the Government stamp should be checked, and the substitution of a lotion for an innocent drug, with all its distressing consequences, should be rendered impossible by the compulsory adoption of bottles unmistakable, even in the dark, from a marked peculiarity of form.

Occupation.—Under the head of Occupation, I would include the kindred subjects of work, rest, and recreation. Perhaps there is no portion of our sanitary legislation which has been so partial in its aim, so unsatisfactory in its results, as that which deals with the protection of workers in trades injurious to health; whilst bakers, for instance, are shielded by a special Act of Parliament, a hundred trades more deadly and pernicious are speeding their victims to an early grave. The reports to the Privy Council, on excessive lung disease and its connection with the occupation of the people, by Dr. Greenhow, in 1860 and 1861; of Dr. Guy, on industrial diseases connected with arsenic; of Dr. Bristowe, on those connected with phosphorous, in 1862; on lead and mercurial poisoning, by Dr. Whitley, in 1863; of printers and tailors, by Dr. E. Smith, in the same year; and others too numerous to mention,—all tell the same sad tale of lives crippled or prematurely ended in the great struggle of modern civilisation.

But not only are many trades unhealthy in themselves,—the hours of work are often far beyond human endurance; and the protection afforded to minors should, in all reason, be extended to adults. Trades Unions, with all their faults, have done good service where they have protested with all their strength against a reckless extension of work time, and the curtailment of needful rest. Many hopeful movements have originated among the trade classes themselves, such as the early closing of shops and the Saturday half-holiday; but they are far from being universally adopted, and a radical remedy has still to be sought for an all-pervading evil. Turning to recreation, we seem to have travelled far indeed from the time when

"Toil remitting, lent its turn to play."

Would that it could be recalled with all its boisterous mirth! We do, here and there, meet with an athletic Christian pastor doing battle with vice and immorality, by leading the thoughtless ones of his flock to cricket on the village green. Working men's clubs, with their lectures and evening classes; libraries, both public and private; with a host of entertainments, elevating and the reverse, invite the studious or social when their day of toil is over; but for the masses in our towns, the aimless Sunday walk, or the cheap

excursion, is often the one healthy recreation of their lives. Whilst athleticism has run riot amongst our middle classes, its very rudiments remain to be taught in the lower strata of our town populations; and much, indeed, must be added to the volunteer movement if we are to restore to the over-tasked thousands that heart and hope which alone can redeem them from pauperism and the depths of despair.

Disease.—In treating of disease, I shall confine my attention to those types which may be almost certainly prevented or controlled by proper sanitary arrangements—the so-called test diseases of a people's health.

The connection of cholera and diarrhœa, with impure water supply as their most frequent source, is at length based on facts too numerous and too stubborn to be denied. The origin of typhoid in sewer gas and foul emanations, of typhus in over-crowding and destitution, is now questioned by a very small minority of those competent to judge. Phthisis has been traced to its home in over-heated, ill-ventilated workshops, and undrained tracts of country.

The infectious disorders of children are now known to be modified by the sanitary surroundings of those they attack; yet how complete is the ignorance of local health authorities of the prevalence or intensity, not only of ordinary disease, but of epidemics even at their very doors. The annual returns of mortality are, with few exceptions, their first intimation—and that two years after date—of the havoc which scarlatina, typhoid, or small-pox may have caused amongst the people they are sworn to protect. Early intimation of disease, and especially of preventable disease, is the very corner stone of all real and effective sanitary organisation; and this leads me to say a few words on the subject of epidemic and contagious disease. At the outset, we are met by a question, the answer to which may one day lead to the most sweeping changes, not only in the remedial, but also in the hygienic treatment of disease. What is infection? Our whole practice in regard to it is based on an hypothesis; the practical sanitarian cannot pause, and while rival schools are debating the existence of an actual *materies morbi*, whether as germ or soluble ferment, he does battle as he can with the disease and death around him. What may be done where energy and heart are devoted to the work has been shown in not a few of our largest towns, but perhaps more conspicuously in Bristol, where efficient inspection, immediate returns of all infectious cases, isolation, followed by thorough disinfection of all about and around the patient—his person, with its poison-laden

products, his clothes, the house, the drains, and the neighbouring sewers—these, with attention to water supply, cleanliness, and the ordinary sanitary conditions, have been the means by which it has been possible* to effect an incalculable saving of life, and, in more instances than one, to stamp out effectually, and at once, the first invasion of a deadly disease. Yet, there are towns in England, not a few, which boast of their cleanliness and health, where the poison of disease is allowed to fester and spread from street to street, unchecked and almost unheeded—where, if the sewers are attended to, no public provision exists for disinfection of bedding or clothes —where the cabs carry infected cases—where, through lack of a public mortuary, the dead lie too often among the living—where children, in defiance of the law, are allowed to infect their fellows in the school, or in their common playground, the street.

The difficulties of contending with epidemic disease are acknowledged to be great, and, with our present sanitary machinery, in some cases almost insuperable. But we stand in a different position with respect to the most fatal of all contagions—that of small-pox; and the various enactments respecting vaccination which have issued since the date of Jenner's immortal discovery, are but types of the half-hearted and inefficient legislation which deals with the Public Health. A disease which, by strict attention to vaccination and preventive hygiène, might be stamped out for ever, still claims its victims in our healthiest towns, where, in defiance of a *compulsory* Act, vaccination has become unfashionable, and has fallen into partial disuse. Far more vigorous, and far more effective, are the measures directed against disease in the lower animals, which affects the trade as well as the health of the people. There can be little doubt that if vaccination and isolation were applied in small-pox with the same energy and persistence as the pole-axe in "rinderpest," England would cease to deplore some 3,000 deaths annually from the disease, and might soon reckon it among the scourges of a byegone and benighted age.

Charities.—No review of the conditions of Public Health would be complete without some mention of the numerous charities, medical and eleemosynary, which minister to the poor in sickness, old age, or distress. Special hospitals for the reception of infectious disorders must form an integral part of any measures for the check of disease; they at once relieve the pressure of a crowded home, remove the poison, and surround the sick with comforts so essential

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* "Four Years' Experience of an Officer of Health," by D. Davies.—*British Medical Journal*, Nov. 13, 1869.

to complete recovery of health and strength. Isolation, speedy and complete, of infectious cases should be the first thought with rich and poor; and it would be well if the special hospital, when it exists, could be largely supplemented by detached rooms and well ventilated houses for the reception, on reasonable terms, or by annual subscription, of the wealthier classes when invaded by infectious disease.

Charges of misdirected charity are now so common and so well substantiated, that there is danger of forgetting, in our first indignation, the vast influence which the general hospital exerts, chiefly through its out-patient department, on the health of the poor in our great centres of population. It is too true that the working-man may be demoralised by the facilities afforded for gratuitous aid and advice—that he may be pauperised by injudicious assistance from district funds and other sources; but the causes will be found to lie deeper still in the harshness of a Poor Law, which makes sickness in the poor a disgrace, and drives all but the most abject on the ever increasing charities of the country. So numerous are the forms which charitable relief assumes, that it would be next to impossible to analyse their separate influence on the general health; but the importance of an organised system of district nursing, under medical supervision, cannot be passed over in silence; it forms the natural supplement to our hospital out-patient system, and by the timely supply of stimulant or food, not only saves lives which are trembling in the balance, but hastens and confirms the restoration to health.

Sanitary Sense.—In concluding this rapid and necessarily incomplete sketch of the subject matter comprised under the rather vague term of Public Health, it may perhaps be thought fanciful to notice what I would call the Sanitary Sense, without which, legislation even the most advanced and farseeing is powerless to abolish, though it may partially abate, the evils which have been mentioned in the preceding pages. If a people has no *faith* in cleanliness, no *faith* in wholesome air and pure water; if they are not themselves convinced of the dangers of over-crowding and of epidemic disease, their ignorance and scepticism on these matters become the gravest obstacles to improvement. Some rudimentary instruction in sanitary matters is urgently needed, not only for the poor, but in our upper and middle-class schools as well. The sanitary sense should be carefully cultivated in the young; and we might then hope, by a ready obedience to the reasonable laws of Health, to attain at last that "Harmony of the moral Nature," which is the end and aim of all true Sanitary Science.

E. T. Wilson, M.B.

ON FASTING AND FASTING PEOPLE.

It was generally supposed that English people living in the nineteenth century had for ever discarded the supernatural; but the case of the Welsh girl, which has lately terminated in so disastrous a manner, leads us to suppose that there is still a section of society (and apparently a very large one) that is easily inclined towards the extraordinary rather than common sense. The miserable part of the Welsh tragedy was, that it was taken out of the sphere of action in which most of these incidents appear, viz., the credulous and ignorant orders of society, and transferred into a semi-scientific class, which, by its proceedings, gave it an air of serious mystery, as though English people really believed in it. Whether from sheer stupidity or mistaken orders the unfortunate child was starved to death, will probably never be known; but, in any case, it is a grievous slur upon the common sense of that Carmarthenshire neighbourhood. In almost every case that history records of extraordinary fasting, a very cursory examination refers them to the same causes, which are generally permanent aberration of intellect, or such derangement of the system arising from disease, that the mind becomes affected, together with the body. Hysteria is, of course, the most prominent cause amongst women; and as this malady is a perfect Proteus for simulating other maladies, it renders the case correspondingly difficult for the physician to detect. But, at the same time, there is no doubt but that cases of fasting occur quite independently of hysteria or any mental aberration whatever; for children of so young an age have been recorded as subsisting without food, that the source of trouble must have been some physical malformation. It is stated, for instance, that a child was born in 1761, at Grenoble, who, originally healthy, had a long illness when he was about eight years old, and recovered from it, save that he could not be brought to eat food for more than a year. Notwithstanding this, he kept his strength so far as to follow his usual work of taking the labourer's dinner to the fields, although his dimensions shrank away to nothing. Then, again, there is the case recorded in "Hone's Every Day Book," of the French Living Skeleton exhibited in this country, who certainly had nothing hysteric about him, but from early childhood appeared to exist as though only to show how very

like death a man could be and live. His diet was never anything more than a biscuit, which took him the best part of the day to eat.

Besides these malformations of nature, cases may arise where determination, backed up by considerable strength of mind, may so far act as to bring the wants of nature into conformity with the will. For instance, a man living near Stamford in 1771, made a heavy bet that he would live for seven weeks without anything solid; and, although he was exceedingly hard pressed, he won his wager, living the whole time on drink alone. Another man, who had considerably more method in his madness, was a miller in Essex, much addicted to corpulence, and a notorious glutton, which perhaps may account for it. After several years of high feeding, he felt very ill, and became a confirmed invalid, till one day a friend put into his hand a book by a foreign writer named Cornaro, from which he perceived that excessive eating was the cause of his complaint. He at once diminished his food to such an extent, that between June and October, 1765, water was his only drink. From October to the next May he only took two and a half glasses of water even; and on the 31st of July in the same year he left off all meat, living on nothing but biscuit pudding. This heroic treatment so far prospered, that he is said to have regained all his former health and strength. In a very interesting recent paper in the *Medical Times*, it is stated that the Trappists have but one meal a day in winter, and two in summer; and that, when they come back to their winter arrangement, they scarcely feel any sensation of being deprived of their usual supply after the first fortnight or so; but when, on the other hand, they return to summer regime, they experience uncomfortable sensations of fulness and flushing. The writer points out that this is a useful caution for people who have any tendency to congestion of the head or skin diseases of the face, and that they should be particularly careful to have their meals at regular times. The Trappists are allowed no meat, fish, butter, or eggs; yet their health is good, gout and indigestion are unknown, and scurvy is never heard of. These, of course, are not cases of pure fasting; but they show how much, under certain circumstances, the stomach may become habituated to fasting, and, perhaps, rather to like it than not. In the "Academy of Sciences Reports" (Paris) it is narrated that Christina Michelot, aged ten, and daughter of a vine-dresser at Pomard, fed upon nothing but water; whereupon a benevolent lady in the neighbourhood took her to her house and experimented on her by substituting, surreptitiously, very clear, strong veal broth instead of the water. It was no use, however; the veal broth was wasted, and the child went into convulsions.

Religious enthusiasm is often a very strong element in fasting cases. We may instance St. Simon Stylites, who ate nothing during the six weeks in Lent, and scores of others, whom much learning did make mad. We must regard the semi-religious tricks of Fakirs and others of that class with considerable suspicion, although there is no doubt that with certain precautions and extraordinary strength of will, these clever vagabonds do a great many surprising things. Dr. Honigberger relates that a Fakir permitted himself to be buried in a vault sufficient time to allow of seed sown at the time to come up and sprout into leaf; while a well authenticated story is told of another Fakir, who, "for a consideration," would die, becoming apparently breathless and pulseless, and remaining in that state for many days. A man at Haarlem, who had become crazy from some family troubles, announced that he was the Messiah, and must fast forty days, which he really did, tasting nothing but a drink of water and a fair allowance of tobacco smoke. This, although it could not have nourished him, might exercise some narcotic influence on the pangs of appetite. The Dutch appear to have been rather prolific in fasting cases, for several of them are mentioned in various writings. In 1589, lived Katherine Cooper, who for five years did not eat or drink, although we are told, curiously enough, that during the whole time "she learnt her Catechism and willingly frequented sermons." Her story is told in "a Notable and Prodigious Historie of a Mayden who, for sundry yeeres, neither eateth, drinketh, nor sleepeth," printed from the Dutch, in 1589.

In this country the most celebrated cases are those of the fasting woman of Ross-shire and the woman of Tutbury. There lived in the parish of Kincardine, in the last century, Catherine McLeod, who, after a long fever, appears to have fallen into a low, bloodless state. She could not hold up her eyelids, and she became unable to use her limbs. For a year and three-quarters nothing passed down her throat, but at the end of that time she suddenly called out for a drink of water, which disappeared with great facility. Pennant, the old topographer, paid her a visit, and says that her neck was contracted, her chin fixed to her chest, and her forehead wrinkled, but that her cheeks were blooming. This latter appears to be a concomitant of starvation diet. Catherine McLeod does not seem to have been an impostor, but simply an hysteric, cataleptic female; and as medical science in those days was not so advanced as it is now, the Justices of Kincardine were fairly taken in, and certified to the supernatural qualities of the case. Ann Moore, of Tutbury, lived in the present century, about 1813; and though she began to

starve herself because she liked it, she kept it up because she found it very profitable. Unfortunately for her, when she had carried it on for four years to her great advantage, a conclave of medical men established a strict watch, and after nine days she gave in, and confessed her imposture before a magistrate. So strong, however, was the desire of deceit, that even when the physician declared she could not survive another hour, she took a solemn oath that she had touched nothing for four years. Mrs. Moore evidently thought at last that a living dog was better than a dead lion; and it is a pitiful thing that the poor little Carmarthenshire girl was not allowed to think the same, before it was too late.

Some interesting details respecting the trade in eggs have been published by a German paper. It appears that the importation and use of eggs in England increase vastly from year to year. From 1843 to 1847, the import for each year amounted to 73 millions of eggs; during the next years to 103 millions, soon rising to 147 millions and 163 millions. In the year 1861, there were 203 millions; in 1864, 335 millions; and in 1866 as many as 430,878,880 eggs, a value of £1,097,197. By far the greater part of our imports come from France; on the other hand, very few eggs are brought from Germany. The cargoes of eggs are chiefly shipped in steamers, and sent to the harbours of Southampton, London, Folkestone, Newhaven, and Shoreham. The time of egg-laying begins in France from January to March; April, May, and June are the most productive months; in July the production falls off, takes up a little again in August and September, leaves off entirely in October and November, and in December is absolutely nil. In order to obtain eggs even at this time, scientific means are employed. The stables are warmed, and the hens are fed with buckwheat and meat. Paris alone consumes 12,000 francs worth of eggs. One may generally assume that the districts which grow buckwheat produce most eggs. The harbours from which the greatest exports of eggs takes place are Calais, Cherbourg, and Honfleur; at Calais the eggs are packed in chests and straw, 1,100 eggs in each chest; at Cherbourg and Honfleur in chests of 600 to 1,200. The business is very profitable, and such results might probably follow in Germany if the landowners, especially the smaller proprietors, would introduce a rational system of poultry keeping. Of late years masses of eggs are opened in the German markets, and the yolk sold cheap; the white being purchased by manufacturers.

POPULAR FOOD ANALYSIS.

No. 2.—COFFEE.

The beverage called coffee is an infusion, or, more generally, as prepared in England, a decoction, of the roasted and ground seeds of a shrub called by botanists the *coffea arabica*. This plant has, however, many varieties, which are named after the various countries where they are produced, such as the *coffea mauritiana*, from Mauritius, etc.; but the true *coffea arabica* always keeps the lead in the market. The total amount of coffee in stock in Europe in January, 1869, has been stated to be 108,580 tons.

The *coffea arabica* is said to grow wild in the mountainous districts of Abyssinia, and appears to have been roasted and infused by the people of that country from the earliest ages. We next hear of its use in Persia, and subsequently of its introduction into Arabia and Constantinople. In this city, its employment seems to have been the subject of a religious "counterblast" during 1540, and the succeeding decade; but without avail, as its consumption soon became a recognised fact. The Greeks, with their natural aptitude for trade, soon took the matter up, spreading its use abroad, and, as we are told by Dr. Johnson, it was first sold as a beverage in London by a scion of that enterprising race named Pasqua, in 1652. Some years afterwards it was introduced into France, and soon began to take such a hold upon the taste of Europeans, as to become, what it now is, one of the most universal beverages throughout the whole of our Continent, and indeed throughout the entire civilised portion of the world.

The coffee plant, which sometimes attains the height of eighteen or even twenty feet, but is more generally about ten feet in altitude, comes into a state of maturity as regards production of berries in three years after it is planted, and usually continues to be fruitful for fifteen years. It bears a white flower, which quickly changes to a fruit, in the heart of which the coffee seeds, commonly but erroneously called berries, are deposited. The fruit when ripe is plucked from the plant into bags, the pods subsequently opened, and the seeds removed, dried, and stored. The coffee is frequently kept in store for a long time before being sent into the market, because it is found to "ripen" or improve in aroma by keeping; indeed,

Mr. Ellis states, that common American coffee, if kept for ten years, will be quite equal to good Arabian.

The effect of coffee on the system is exhilarating, while it yet soothes, lessens the desire for solid nourishment, and retards the waste of the tissues. It enables persons to bear fatigue, both mental and bodily, and is consequently much in vogue with those "who burn the midnight oil." It has been stated by the advocates of temperance principles to be much better than alcohol as a counteragent against the extreme temperature of a northern winter, and that those who partake of the latter substance, under the various pretexts of "taking the chill off," or "just a toothful to keep out the cold," would be much better protected if they could be persuaded to take their "nip" in the shape of a cup of coffee. The wakeful properties of coffee are well known, and it is this which undoubtedly gave rise to the amusing, though improbable, story of its discovery. It seems, so saith this veracious legend, that an Abyssinian owned an ass, which he tied nightly to a bush adjoining his tent. Hitherto the patient animal had not rendered the shades of evening hideous by unwonted sounds, but all at once it gave evidences of wakefulness, and disturbed its master's rest by loud vocal demonstrations. Notwithstanding the kicks and thumps showered upon its devoted carcase by its irate lord, it persevered in nocturnal braying. Worn out at length, he watched and observed the animal eat, with infinite relish, a quantity of berries from the bush. Struck with a bright idea he did so likewise, but failing to discover any merit in the fruit, he roasted it, and found that his eyes were opened, that sleep was hindered, and that in fact he had made a valuable discovery; and so in future he changed the donkey's quarters, and appropriated the fragrant coffee to his own use.

These effects of coffee are due to three principles which it contains, viz.: (1), a *volatile oil*; (2), a substance called *caffeic acid;* and (3), an alkaloid called *theine* or *caffeine*. The volatile oil does not exist in the raw seed, but is developed in the process of roasting; and direct experiments have shown that we must, in some measure, ascribe to this oil the exhilarating effects of coffee. The caffeic acid is an astringent body akin to tannic acid, and, although it is somewhat altered in the roasting, Dr. Stenhouse states that "chemists generally are disposed to refer the flavour and peculiar properties of coffee as a beverage more to this acid than any other constituent." The third important matter in coffee is theine, or caffeine, a full chemical description of which we reserve for our notes on tea, but as to which our readers have already heard something in Mr. Cochran's article on coffee tea, in the last month's

"Food Journal." The exact composition of coffee will be apparent from the following analysis by M. Payen:—

Cellulose	34·000
Water	12·000
Fatty substances	13·000
Glucose, dextrine, and vegetable acid	15·500
Legumine, caseine (gluten)	10·000
Caffeate of potash and caffeine	5·000
Nitrogenous substances	3·000
Free caffeine	0·800
Concrete essential oil	0·001
Aromatic fluid essential oil	0·002
Mineral matter	6·697
	100·000

In addition to the above, Dr. Stenhouse states, that coffee contains 7 per cent. of cane sugar.

From all these considerations, it is evident that coffee is an article for which it is not easy to find an imitation; as any other plant, to be equally useful, must contain the three important constituents above referred to: and there is apparently no other seed known, which would fully answer as a substitute in this respect. Looking to the great activity and peculiar properties of these substances, we cannot help seeing that, in permitting, as we now do, the admixture with coffee of vegetable matters totally devoid of them, we allow a serious injury to be done to many who depend on this beverage as an aid to the quickening and endurance of both their mental and bodily powers.

We will now glance at the adulterations already discovered in coffee. From a careful investigation of the report of the Lancet Sanitary Commission, published about sixteen or eighteen years ago, and other kindred works, we have compiled the following formidable list of adulterations detected:—

1. Chicory.
2. Roasted wheat.
3. ,, peas.
4. ,, beans.
5. ,, carrots.
6. ,, mangoldwurzel.
7. ,, rye.
8. ,, acorns.
9. Sawdust.
10. "Coffina" (lupin seeds).
11. Oak bark.
12. Groats.
13. Baked horse's liver.
14. "Black jack."
15. Reddle.
16. Venetian red.

These are, therefore, the matters which were employed in those days for the sophistication of coffee; but we are informed in the last edition of Dr. Hassall's work, published in 1861, and, therefore, bringing the subject to a little more modern date, that the state of the article had somewhat improved. He says:—"The grosser

adulterations, whatever may be the state of things in the provinces, so far as the metropolis is concerned, are now much less frequently practised; the principal adulteration is that with chicory. . . . This improved state of things is undoubtedly due to the repeated exposures made within the last four or five years. But is it not perfectly certain, if these exposures were to cease, that matters would soon become even worse than before, and that the scandalous and nefarious practices which once prevailed in the adulteration of this article would speedily be rife again?" The exposures referred to, which, we presume, were principally those undertaken by this gentleman under the auspices of the *Lancet*, having now ceased for a series of years, the question arises, Are we really relegated to the old state of matters? As good *prima facie* evidence on this point we give the following:—

Statistics of the Coffee Trade of the United Kingdom for the last Ten Years.

IMPORTS.—(Tons.)

	1859.	1860.	1861.	1862.	1863.	1864.	1865.	1866.	1867.	1868.
British Possessions ..	23,084	31,608	30,172	32,540	43,763	40,227	50,234	44,925	46,335	60,000
Foreign do. ..	6,091	5,356	7,119	9,443	8,627	8,599	11,456	11,792	15,150	17,500
Total	29,175	36,964	37,291	41,983	52,390	48,826	61,690	56,717	61,485	77,500

EXPORTS.—(Tons.)

	1859.	1860.	1861.	1862.	1863.	1864.	18 65	1866.	1867.	1868.
British Possessions ..	9,693	16,185	16,615	17,783	25,714	27,812	36,030	31,923	31,900	47,000
Foreign do. ..	3,515	4,200	4,278	7,619	6,154	7,594	8,561	10,364	11,670	14,000
Total	13,208	20,385	20,893	25,402	31,868	35,406	44,591	42,287	43,570	61,000

HOME CONSUMPTION.—(Tons.)

	1859.	1860.	1861.	1862.	1863.	1864.	1865.	1866.	1867.	1868.
British Possessions ..	13,387	14,157	14,424	14,095	13,164	12,932	12,355	12,436	11,720	11,700
Foreign do. ..	1,938	1,690	1,291	1,285	1,462	1,069	1,372	1,378	2,373	2,100
Total	15,325	15,847	15,715	15,380	14,626	14,001	13,727	13,814	14,093	13,800

STOCK REMAINING AT THE END OF EACH YEAR.—(Tons.)

	1859.	1860.	1861.	1862.	1863.	1864.	1865.	1866.	1867.	1868.
Total of all kinds	9,200	11,201	10,575	10,745	15,801	14,439	17,100	16,906	20,044	23,000

By these statistics we see that, notwithstanding continually increasing imports, we have a regular diminution in the amount of coffee taken for home consumption. What reason can be assigned for the fact that, with a steady increase in population, we have an equally steady falling off in the consumption of so popular an article? Can it be possible that the worse than useless chicory and dandelion have, like treacherous parasites, insinuated their loathsome tendrils so deeply into the parent stem of public taste as to sap its vitality, and deaden its ability to appreciate the true aroma of the fragrant berry, and so enable the tradesmen to put, year by year, less and less of the real article into the so-called coffee without detection?

Having thus seen what has been formerly said about coffee, we will now proceed to consider the actual state of the article at the present day; and as the most self-evident manner of showing this, we give the following:—

Results of the Examination of Forty-seven Samples of Coffee purchased in London (none of which were stated to contain Chicory, but all sold as Coffee.)

Price.	Locality where purchased.	Adulterations.
2/-	Piccadilly	None.
1/8	Waterloo Road	,,
1/8	York Road, Lambeth	Large quantity of chicory.
1/8	Piccadilly	None.
1/8	King William Street	,,
1/8	Whitechapel	,,
1/8	King's Road, Chelsea	,,
1/8	Gracechurch Street	,,
1/8	Walworth Road	,,
1/8	Leather Lane	,,
1/8	Oxford Street	Chicory.
1/8	Strand	None.
1/8	Keppel Street	,,
1/8	Whitecross Street	,,
1/8	Albany Street	,,
1/8	Fore Street	,,
1/6	Whitechapel	,,
1/6	Peckham	,,
1/4	Oxford Street	Chicory.
1/4	Keppel Street	,,
1/4	King William Street	None (but inferior).
1/4	Walworth Road	Chicory and roasted grain.
1/4	Gray's Inn Road	,, and a little roasted grain.
1/4	Stoke Newington	,,
1/4	Islington (High Street)	,,
1/4	Gracechurch Street	Roasted grain.
1/4	Bermondsey	Chicory and roasted grain.
1/4	Fore Street	,,

Price.	Locality where purchased.	Adulterations.
1/4	Bethnal Green Road.. ..	Chicory.
1/4	Albany Street	None, but contains husk or "parchment"
1/-	Bethnal Green Road.. ..	Chicory and roasted grain.
1/-	Whitecross Street	,, and sand.
1/-	King's Road, Chelsea ..	,, and roasted grain.
1/-	Strand	,, ,,
1/-	Peckham	,, ,,
1/-	Leather Lane	,, and foreign roots.
1/-	York Road, Lambeth ..	,, and roasted grain.
1/-	Waterloo Road	,, ,,
1/-	Dean Street, Soho	,, ,,
1/-	King Street, Seven Dials..	,, ,,
1/-	Clare Market	,, ,,
1/-	Drury Lane..	,,
1/-	Ratcliffe Highway	,, ,, and sand.
1/-	Ball's Pond..	,, ,,
1/-	New Cut	,, ,,
1/-	Euston Road	Stinking berries.

None of the adulterated *1s. 4d.* samples contained more than 50 per cent. coffee, and some much less; while none of the *1s.* coffees contained more than 25 per cent. of that article, and many of them almost none at all.

Thus we see that of the whole forty-seven samples only sixteen were pure and good, while eleven contained pure chicory, and seventeen that material mixed with other adulterations. The adulteration noted as roasted grain is principally made by means of raspings of loaves, stale sea biscuits, and other refuse farinaceous matters. This sophistication seems to be the most in vogue at present, and it is certainly the best to defeat popular detection by the sense of smell. We were much struck with the fact that all the coffees so adulterated had a most palpable fragrance to the nose, but entirely lost this quality when infused and tasted. We accordingly made a set of experiments which showed us that bread refuse, etc., placed in a closed roaster with a quantity of real coffee at the one end, came out with the aroma communicated. This is doubtless the reason why it is used instead of chicory; and if we are to accept the adulteration of low priced coffee as an invariable and inevitable fact, we would much rather drink bread coffee, than an infusion of chicory or dandelion.

In our next number we will continue this subject by considering the adulterations practised on chicory itself, and giving directions for the detection of the sophistications of coffee, illustrated by engravings of their microscopic appearances, drawn by the *Camera Lucida*, so that our readers may easily examine the article supplied to their households.

J. Muter, Ph.D.

DISADVANTAGES OF A POTATO DIET.

Every known article of food fulfils more or less perfectly the conditions incidental to a proper diet. Sugar alone, protein starch, or fat alone, could not support life; but a combination of two or more alimentary principles, with an adequate selection of what are called regulators, contains the elements necessary for the nourishment of animal and man. We have before us an article by a German professor, Dr. Artus, of Jena University, in which that gentleman undertakes to show that potatoes in themselves do not contain such ingredients as are required for the healthy sustenance of the animal frame,— in fact, that a strict potato diet is fatal to the continuance of life. He says that in the nutrition of men as well as of animals the generation of blood must be considered as of primary importance, since from that source are derived not only the tissues, nerves, brains, and muscles, but also all solid parts of the body. The blood itself is to be regarded as a combination of sugar, fat, albuminous, and saline matter. Now, since food has to provide these materials, it is evident that it must contain such substances as will either fulfil the function of fat producers (such as sugar, starch, etc.), or provide albumen, fat, and saline matter. The articles used as food rarely contain these ingredients purely, and it is hence necessary that, through the process of mixing them with saliva, gastric juice, etc.,—in fact, by what is termed digestion,—they should be transformed into components of blood. If we feed an animal with articles showing no resemblance to such components—if, for instance, we take the *amyleon* (starch), which forms a principal part of the potato—an operation of the juices begins, which transforms the amyleon into sugar, and, by-and-by, through the action of the bile, the pancreatic and intestinal juices, ultimately into fat. Since the latter is found in the blood, we have to reckon starch as well as albuminous matter, such as legumine,* gluten,† etc., among the blood generators. It seems inconsistent to classify fat with the agents of respiration. A knowledge of the above metamorphoses

* Legumine is that portion of pulse containing nitrogen.

† Gluten is the representative of legumine in the various kinds of corn *(Cerealia)*.

will enable us to comprehend the position of the suckling with regard to its only food, the milk. For we perceive that the casein (that portion of the milk containing nitrogen), by digestion, is transformed into albumen, and further, by the process of respiration, into fibrin, which is partly found dissolved in the blood, but which is also found as muscle in the fleshy parts of the body.

The above allusions will enable us better to understand the following considerations bearing upon the question before us: "By request of the Gardeners' Association *(Garten-Bau Verein)*, I (Dr. Artus) analysed twenty-three different kinds of potatoes, reared under varied conditions of soil and manure, and I found that in 100 parts of peeled potatoes there were 0·76 to 1·52 albumen. The latter figure was obtained from a specimen cultivated with fresh manure. The 2·78 to 3·89 per cent. ashes, which I obtained by drying the different samples at 110° C., contained but trifling amounts of phosphates. From these data it is apparent that potatoes do not supply the body with that which it essentially requires. If flesh is to be made as well as fat, and in due proportion to the latter, then such elements should be supplied as will introduce the necessary albumen and saline matter.

Treating the subject with regard to the feeding of animals specially, a few hints might be given as to the most profitable proceeding in the matter. Where milk is of little value, an addition of that article to the steamed potatoes would serve the purpose; but where milk is rare, or where it is more profitably turned into something else, another means of supply will have to be devised. Bones (remains of joints, etc.) yield a very appropriate companion to the potato diet. They, of course, have to be prepared; and that is done by boiling or steaming them in the first instance, so as to remove all fat, after which they have to be dried and ground into a fine powder. The phosphate of lime and a kind of albuminous substance which they contain make the bones productive of exactly those essentials in which the potatoes are deficient, namely, albuminous and saline matters. An improvement can be effected by pouring 1 lb. of hot water over 1 lb. of ground bones, adding the same quantity of milk. The mixture ought to remain in a tolerably warm place for eight days, during which period it is to be stirred occasionally. Half a tablespoonful of this preparation will be found to be an adequate addition to the quantity of potatoes sufficient for a meal.

E. H. Fournier.

THE MIS-USE OF MEAT.

The writer who ventures to refer to the probability of food and the preparers thereof having a different origin, may very fairly be charged with plagiarism. The idea is old, has been expressed in a thousand different forms, and in every language in the world. The Hollander, notwithstanding that his palate may have lost a portion of its original delicacy in consequence of an over indulgence in schnaps and bad tobacco, has been heard to mutter phrases concerning "der Teufel," the reverse of complimentary to the good Frau, who in preparing a mess of dumplings had forgotten the salt. The Spaniard who complains of his chestnuts being over-roasted, but who eats his uncooked melon with content, is "less nice than wise" in his reference to the influence that caused the stove to burn too freely and so destroy his meal. The Italian with his macaroni; the Lapp, when his train oil is not properly frozen; the Red Indian, from whose buffalo hump the gravy has been allowed to escape; the sailor who speaks disrespectfully of "man's best friend," whilst breaking his teeth over "old horse;" the Irishman, when the potatoes turn out "waxey;" and the Englishman whose beef or mutton is raw on one side and burnt to a cinder on the other,—have all a thought in common, that, taking shape in words, ascribes a beneficent source to the meat, but a less complimentary one to the cook. But whilst the general truth of the proposition appears to be established, occasions may arise on which too much credit is ascribed to the meat and too little honour rendered to the cook. Some people are hard to please, and remind one of the lad who, after complaining of his food, was asked by his master "whether he was not supplied by the cook with sufficient meat?" "Yes," he said, "there's plenty of it, such as it is!" "Do you not get good food?" he was then asked, "O, it's good enough, what there is of it," he replied. And so it often happens that the thankless spirit of the eater, and not the shortcoming of the cook, is to blame. Meat is mis-used in a variety of ways. Want of care, extravagance, and ignorance are the most common causes. Among the well-to-do, complaints of the extravagance of servants and their mis-use of meat are matters of every-day comment and vexation. Beef is boiled,—not to rags, for in that

case there would be a stage in the cooking, at which, if the process could be stopped, the meat would be excellent,—but to a substance harder than leather, and as indigestible. Mutton, poultry, and game are often literally "roasted to rags," in accordance with a certain defined system, and not from mere carelessness or inattention. In fact, this cooking, or rather the habit of leaving the meat to cook itself, for the latter appears to be the formula followed, seems to be a part of a recognised institution. When a mistress and her cook are arranging the preliminaries of the duties to be rendered on the one hand, and the remuneration to be paid on the other, a claim for "perquisites" is advanced by the servant, and, in too many cases, allowed by the mistress. These perquisites are included in what is euphoniously designated as a "grease pot." What becomes of the contents of the "grease pot," when they pass out of the possesion of the cook, I have not been able to ascertain. Certain persons who are said to purchase "kitchen stuff," also sell prime Dutch butter made up into symetrically shaped pats. These pats of butter are again sold by many respectable shopkeepers to many of the families whose cooks sell their perquisites. Whether there is any connection between the pats of butter and the grease pots I cannot tell; but if so, there is then a decided "mis-use of meat." Butter is good, and grease is good, but they are best kept apart, and each is valuable in proportion as it is put to its legitimate purpose.

Over-boiling and over-roasting are not the only means by which the "grease pot" is enriched at the expense of the master of the house, and, as I shall presently endeavour to show, to the cost of the sick, the sorrowful, and the poor. Grease, that is the skimming of pots in which meats have been boiled, or the dripping that results from the roasting of joints, forms by no means the only contents of the grease pot. According to the cooks, butchers are prone to indulge in a reckless and inartistic manner of cutting their joints,—so reckless, indeed, that decent carving would be impossible if the crude design of the butcher were not supplemented and improved by the delicate touch and discriminative "toning down" of the cook. Edges must be pared and corners rounded; the fat and the lean must each show its just proportions of colour and form; parts must be taken off, so that a plumpness of appearance may be given to the joint; surfaces must be levelled, skin taken away, and gristle extracted,—to the great benefit and increase of the cook's perquisites.

The various modes of waste could be multiplied to a considerable extent, and need not be argued here. The carelessness that can

destroy anything which might, if properly applied, add to the comfort of a fellow creature needs no stigmatising. But

"Evil is wrought for want of thought,
As well as want of heart;"

and by man and master, mistress and maid, much evil may be averted by a little careful consideration and arrangement.

This "institution" of perquisites appears to be a cause of much misunderstanding between the rich and their servants. Ladies seldom understand, or care to ascertain, the quantity of meat requisite to supply the wants of their families. I have been asked by a thoroughly practical woman, "How many pounds of meat per head per week shall I allow in making my purchases?" I must confess—though I have lived on and served out rations—I felt a difficulty in answering the question. At first, with the "priggishness" that characterises many small people when they are consulted on things they do not understand, I, having Australian experiences fresh upon me, answered, "Ten pounds per week," and got laughed at for my pains. Few ladies, if asked how much meat was required to make a hash or a stew, a curry or a pie, for half a dozen persons, could give any save the vaguest answers. Hence cooks in whose nature conscientiousness has not been largely developed, take advantage of the ignorance of the mistress, and increase the contents of the grease pot to the detriment of the comfort and means of the family.

It is of course not difficult to point out remedies for this state of things. The fat resulting from the paring and cooking of joints could always, if carefully managed, be used for puddings or pie crusts, instead of being thrown into the grease tub. Bones could, and indeed should, be boiled down for "stock," and the butchers bill would be lessened. The remains of joints, instead of being thrown into the wash bucket or grease tub, would make capital stews, hashes, or curries; and if the mistress visited her kitchen and larder every day, now and then her scullery, checked her tradesmen's books, and generally undertook matters for which she may have a great dislike and no aptitude, a very general and desirable reform might be anticipated in the matter of the mis-use of meat.

Let me point out one remedy for the mischief. "The poor we have always with us," and are likely to have. Can their case be brought in to heal the difference that exists between mistress and maid with respect to the mis-use of food? I think it may, and I shall endeavour to show how. There is nothing new about my plan; it is adopted in thousands of families, and I desire to see it extended. If the "Food Journal" is the instrument of doing this, it will have fulfilled one of its best and noblest functions.

Taking it for granted that the cook is paid a proper wage, and that the savings from actual waste would go towards doing an outside, but very distinct good, it would be easy to prevail upon the servant to aid in effecting that saving. Most servants know, either from personal or indirect experience, of the heavy want and woe that attends upon the existence of the very poor for want of food; many of them in their earlier years have experienced the want themselves, and how bitter it is nearly all of them can understand. To save for their well-to-do employers may seem to them an unnecessary work of self-denial. If, however, their savings were devoted to relieving those whose wants are patent to them, an inducement for thrift and carefulness would be offered that no merely selfish motive could furnish. Thus, if the dripping and the fat, the butter-milk and the skim-milk, the clippings and parings of joints, the broth and the pot liquors, the fag ends of loaves and the "unconsidered trifles" that fall from every rich man's table, were devoted to the feeding of the poor, the human nature that abides in every man and woman would make it a necessity of the cooks nature to aid in every way towards helping those who so much require help.

Let the mistress then who objects to allowing the perquisites of the grease pot and the pig trough, keep her servant informed of the fact that all saved from waste goes to feed those who deserve it, and the best feelings of the whole household will be enlisted on the side of saving. If to give a cup of cold water to the "least of the little ones" was accounted well-doing, then those who feed the hungry from their waste and hitherto mis-used meat will not be without their reward.

The poor mis-use meat as well as the rich. A very little care would add greatly to the comfort of even a poorly provided household. It is not unusual for families, several members of which earn money, to make the majority of their meals off bread and butter and tea, fancying that by this means their time is saved. These viands have such an economical and poverty-stricken look about them, that any idea of the repast being the result of sheer idle extravagance never strikes them. The big fires and gigantic cooking ranges of the rich, have a good deal to answer for in the way of waste, but the poor—Heaven help them!—are in little danger of over-doing their food through excess of firing. The little, scanty fire that they keep up would, however, without additional cost, convert the meal of tea and bread into a warm, comfortable dish. Careful cooking in many instances means slow cooking, and the poor are, unhappily, well provided for in being able to cook slowly.

A little meat judiciously added to a few potatoes and other vegetables, placed upon the hob and allowed to simmer away until wanted, would make just as cheap a meal as the bread and butter. How immensely superior it would be in every respect need not be urged. A little time ago I had to visit the London Docks, and whilst waiting, twelve o'clock struck, and the dock labourers "knocked off" for dinner. It was a bitterly cold day, and comfortably clad as I was, I felt glad to seek the shelter of the sheds. In the compartment in which I found myself, ninety-seven men were at dinner. Seventy-two of them were dining off hunks of bread, with, in some instances, a greasy substance that might have been called butter, but was only so in name. Even with the same materials the meal could have been considerably improved and made more comfortable. Boiling water, salt, and pepper added to it, would have made what, in the north of England, is called "browis." Browis, however, would be poor stuff for a dock labourer to live upon, and if the covered can, that most of the men had with them, had been filled over-night with potatoes, onions, and a scrap or two of meat, allowed to simmer so long as the fire remained, and, if possible, warmed up at dinner time, the men would have been in far better heart for their work on that bitter, cold November day.

To attempt, within the compass of a single paper, to enumerate the many means of mis-using meat that are practised constantly, would be to overshoot the mark, and destroy whatever effect the indications I have endeavoured to point out, might have. Every one may, with very little trouble, identify instances of mis-use falling within their own experience; and if the thoughts of readers take that direction, there will be less mis-use of meat, and, as a consequence, a greater number of people will be fed.

E. Carton Booth.

From America we have news of a very spirited attempt to undertake cattle feeding and meat preserving on a large scale. The scheme is originated by Dr. Bell, well known at the Royal Geographical Society, for his account of the Colorado basin; and he is supported by the Kansas Pacific Railway Company, which has offered great facilities in the shape of land and carriage. Dr. Bell has made arrangements to use Professor Gamgee's meat preserving process, the capabilities of which will thus be tested in the most complete manner.

CHINA DISHES.

Old china is found everywhere; our grandfathers and grandmothers delighted in punch bowls, egg-shell teacups, and porcelain monsters; and now every museum in Europe contains numerous specimens of chinaware which serve, when a hundred or a thousand years old, as the best models which can be set before the pupils of the ceramic art; but dishes and bowls are intended for use as well as show; and as ours is a journal of the useful and agreeable, though not of the *beaux arts*, we shall say a few words about what China dishes sometimes contain.

We have no intention of writing a dissertation on birds' nest soup, curried rat, or roast puppy; these are stale curiosities, although they have not yet taken their places on our tables. Our object will be to cull a few less hackneyed necessaries and luxuries.

The Chinese method of bread-making is curious; the flour is mixed with water, and the dough rolled by hand, and then shaped into cones, which are placed on trays or stands made of split bamboo, and cooked in the steam arising from cast-iron boilers; of course such bread resembles our own but little, being a good deal like a steamed hard dumpling. Much of this bread is made of maize; but wheat bread is much preferred. Rice, however, is the common bread of China, and the Chinese know how to boil it, which is not often the case in Europe. This is cooked much in the same way as the bread, being first washed very carefully in several waters, then placed in bamboo baskets, and suspended in the steam; or it is boiled for about half-an-hour, and then put into a bamboo basket, and not served until nearly all the water has drained away; but in whichever way it is cooked, the grains are distinct, like the little fishes in well cooked whitebait.

Peas pudding is not a luxurious or very expensive dish; and the Chinese have what they call pea-cheese, which holds much the same rank; it is a very cheap and useful article of diet, prepared from oleaginous peas, which are also eaten as vegetables, and from which a rather expensive kind of oil is made. The making of this cheese, although a simple operation, requires considerable care; the peas are first steeped in water for twenty-four hours, and are then drained in a basket; they are then ground in a hand-mill com-

posed of two hard stones, the upper having a hole in the centre through which the mill is fed, like a baby, with a spoon, the water in which they have previously been, being added from time to time, so that the peas leave the mill in the form of a thin paste, which is placed in a filter, and kept constantly agitated by hand; the filtered liquid is boiled very slowly in an iron vessel, and presently becomes covered with a thick scum; it is then turned into a wooden vessel to cool; and, after being stirred about for some time, a pellicle is formed, which is carefully taken off with a wooden ladle and then drained; and this is eaten either fresh or dried, and has somewhat the flavour of new cheese. This is not, however, the pea-cheese, which is made from the liquid in the vat; but a small quantity of water containing plaster is added, and a few drops of a concentrated solution of salt obtained from the saline marshes; the plaster has the effect of coagulating the caseine of the peas, and the whole mass, after being slightly stirred, becomes solid. The cheese they produce is put in wooden frames about 15 in. square and 2 in. deep; and these are placed on a stone to drain, with a piece of linen of close texture below each frame; when sufficiently drained, the cheese is compressed, by means of pieces of wood loaded with weights, to about half its original thickness, and is then packed in boxes, and often sent great distances. The cheese will not in its natural state keep more than a day in hot weather; but is often salted and otherwise preserved, so as to keep good for years. A lump of it as big as a man's fist does not cost more than half a farthing. The poor Chinese also drink the liquid before it is coagulated, and the cheesemakers' shops are constantly filled with crowds of customers. Pea-cheese forms one of the staple goods of the country, and is highly nutritious. When fried in oil or grease, like potatoes, it makes a very delicate dish. Dry pea-cheese contains about 24 per cent. of fatty, and 8 per cent. of azotized matter.

The Chinese and Japanese produce gelatine from a marine plant, *grateloupia filicina*, to which the name of *gelose* has been given by the French chemist, M. Payen. The plant is washed many times in water, and bleached by exposure to the sun and dew; it is then washed again, and again laid out to bleach, and these operations are successively repeated until the required colour is obtained; finally, it is cut in pieces, boiled for a long time, and squeezed violently in a linen cloth. The liquid thus produced is placed in moulds, and evaporated to dryness in the sun. This gelatine is used to make jellies, and also to thicken dishes; and it is also cut up into small pieces, and put into soup, like toasted bread, before serving.

Besides ordinary sugar, the Chinese prepare sugar from germinated wheat and rice; this glucose is called gelatine sugar, and is used in making barley sugar and other sweetmeats; it resembles manna in appearance, and enters into several pharmaceutical preparations. With this glucose, raw sugar, etc., the Chinese manage also to make an imitation of honey, which deceives most people.

The Chinese are very fond of eggs, and have more than one method of preserving them, the most common being to place them in a mixture of clay and water, and then allow them to dry in the sun, so that the clay forms a hard crust around them. But the following is the mode of preparing eggs for Chinese *gourmands*. The eggs are each covered separately with a paste composed of tea, quicklime, sea salt, and oak ashes, then rolled in rice straw ashes, and packed in boxes with masses of rice to keep them from touching each other. They remain thus packed for three months, when they sell for about a penny each. They undergo a curious transformation; the yolk has turned green, the white is coagulated, and they emit a very strong sulphurous smell, yet the Chinese consider them delicious! Well, who has a right to laugh at them,—those who eat raw oysters, snails, high game, or decayed cheese?

We conclude with the copy of the bill of fare of what is called a regular mandarin supper, given by Sir Charles Macdonnel, at Hong Kong, in 1867, to the Duc de Penthievre, the Comte de Beauvoir, and some other French gentlemen:—"Preserved fruits; fish roe in sweet caramel sauce; almonds and raisins; shark fins in gelatinous sauce; cakes of coagulated blood; hashed dog, with lotus sauce; birds' nest soup; lily seed soup; whale nerves, with sweet sauce; Kwaï-poh-Hing ducks; sturgeons' gills in compote; croquettes of fish and rat; sharks' fat soup; stewed sea-snails, with tadpoles; sweet dish composed of fish fins, fruit, ham, almonds and essences; lotus and almond soup as dessert; with medicated wine and warm arrack. The mixture sounds curiously to European ears, yet the Chinese have the reputation of being great epicures.

G. W. Yapp.

The following is said to be the present annual consumption of bread in Paris:—Bread (ordinary), 218,113 tons; fancy, 130,943 tons; brown, 8,230 tons; rye, 678 tons; fine (*pain gruau*), 2,000 tons. Total, 359,964 tons. The quantity of flour required to produce this amount of bread is nearly two millions of sacks. According to the above account, the daily consumption of the city is nearly one thousand tons of bread, and five tons of flour.

THE WINES AND BRANDIES OF LANGUEDOC.

PART II.

The *muscat wines* are made from muscat grapes, mostly white, more rarely black ones. The grapes are exposed to the heat of the sun until they are half transformed into raisins. They are then mashed, and the juice is expressed. The most notable of them are made in the vineyards of Frontignan, on a surface of about 230 hectares, from the two varieties called the white muscat and the red muscat. There are annually produced about 800 or 900 barrels, containing from 220 to 225 litres each of white muscat wine; of red muscat there are only 20 hectolitres produced. This latter wine somewhat resembles the Cape Constantia wine. The barrel of muscat wine varies in price from 120 to 200 fr. But the citizens who drink this wine pay much more for it; indeed, up to five and ten times its original value. The vineyard of Lunel occupies only 50 hectares, and is still diminishing. Here also the white and red muscat are grown, and much sweet wine is made; but at present the proprietors turn towards the production of other wines. The Lunel muscat was formerly celebrated in many parts of the continent, and considered a treat; but since the discovery of the power of elder-flower, a drink can be made by its aid from alcohol, sugar, and a little tartaric acid, which in many cases is superior in flavour, and certainly in purity, to true muscat Lunel. In consequence of this, the muscat has lost its standing. There are yet muscat wines of Maraussan and Espagnor to be mentioned. Their production and nature are similar to those described in the foregoing.

The most important industry of the department of l'Hérault is the manufacture of trois-six and eau de vie of Montpellier. Of the trois-six, which, in accordance with custom, I shall write 3/6, two qualities are made,—3/6 of wine, and 3/6 of murk. The former productions are called "of good taste" (de bon gôut) when the wine from which they have been made was neither spoiled nor sour. The second sort are always called 3/6 of murk, and are in general from 25 to 50 per cent. less valuable than the others. The 3/6 of good taste occupy the most important position both as regards quality and quantity. They are obtained by means of a still, which, from its inventor, is called "De Rosne's." This apparatus is made in great numbers at Mèze, Lunel, Montpellier, and

Béziers. It costs from 2,000 to 4,000 fr., and yields in twenty-four hours of distillation from two to four pieces of alcohol of 86 per cent. strength, each piece being six hectolitres. Two men, the distiller and an assistant, are sufficient to conduct the working of an apparatus. The distiller regulates the fire, the level of the wine in the columns of condensation and of distillation, and also the evacuation of the residues. The assistant feeds the reservoirs containing the wine, rolls the pieces to the pump, and occupies himself with the other accessory detail. When the apparatus is kept in action day and night, two distillers and two assistants become necessary for the twenty-four hours. The wages of a distiller are 3 fr. a day; those of an assistant 2 fr. The production of 3/6 is very regular in this kind of apparatus, and depends of course mainly upon the strength of the wine employed. The wines of the plain contain from 7 to 11 volume per cent. of 3/6 of 84°. It is, therefore, clear that an apparatus which can produce four pieces per day, and consume 336 hectolitres of feeble wine of the plain containing 7 per cent., will, when consuming wines containing more alcohol, say 14 per cent., only consume half the quantity, that is, 168 hectolitres of wine. The average strength of the wine distilled is between 11 and 12 per cent. of 3/6 when the year is good, so that one can assume that a manufactory which produces four pieces of 3/6 in twenty-four hours, consumes from 230 to 240 hectolitres per day. Such a manufactory, therefore, discharges every day more than 200 hectolitres of residue. These residues have a repulsive odour, and, being let into the rivers and water-courses, infect the air more than sewage. Hitherto no use has been found for them, either on account of their potash or their tartaric acid.

The price of wine used for distilling is dependent upon the quantity of alcohol which it contains. It is generally ascertained by means of small assay stills, and the specific gravity of the distillation is measured by a centesimal areometer. Proprietor and manufacturer each determines the quantity of alcohol contained in the wine to be sold, and afterwards they discuss the price to be paid. A manufactory which is in good condition, and well constructed, can make 100 pieces without being cleaned; but it is considered well to clean the apparatus at the slightest sign of impurity; for when it becomes dirty, it produces much less spirit in the same time while burning the same amount of fuel. Moreover, in the dirt there is lost much wine or alcohol. A loss of alcohol is experienced also when the apparatus is not well closed. The spirit which has been distilled is always tested with the aid of the alcoholometer of Bories. This is a very ancient instrument, and the manufacturers and pro-

ducers of the Languedoc are as reluctant to give it up as the German are with regard to Tralles', or the English are with regard to Sykes'. The piece of 3/6, accompanied by a warranty of its quality, is taken to the market. The inspector of the market verifies the analysis, and, if correct, admits it; if incorrect, returns the piece; he also states the limpidity, which must be perfect; he observes the colour, of which there must not be any; the taste, which must be pure and free. The accepted piece remains in the hands of him to whom it is sent. The piece which was not in perfect condition is kept until a reduction in the price may have caused it to be accepted. If the piece were of very bad quality, it would be judged and pronounced "mauvais goût," and in that case would be paid for only as 3/6 of murk. There are in the department of l'Hérault four markets for eau de vie and alcohol. They are in the order of their importance—Béziers (on Friday), Pézenas (on Saturday), Cette (on Wednesday), and Lunel (on Monday). If there are no stipulations made to the contrary, the manufacturers of 3/6 are bound to deliver all produce to one or other of these markets. All 3/6 is paid for in cash. One day in every week is assigned in each of the markets for the settling of accounts between the merchants, manufacturers, and brokers. The 3/6 is received by the inspector every day except Sunday, and each market has its special inspector. The salary of each inspector consists of an impost of half a franc upon each piece.

The apparatus of De Rosne, which I have mentioned, can be used to make alcohol called "trois-cinq" (3/5), and another kind called "proof of Holland." The strength of the 3/5 is 78° centesimal; that of the proof of Holland is 52°. This being by volume, is equal to the English proof spirit. These liquids are put in barrels, transported and delivered just in the same manner as the 3/6, and their current price depends upon that of the 3/6. The 3/5 or the 5/6 are employed to strengthen wines—as the French say "viner les vins"—which have not got body enough, and require to be exported. The Holland proof serves for the same purpose. They are also used for making the better class of eau de vie of Montpellier. The first class are made with white wines just fermented, which have not been fermented with the stalk. Generally, the good quality of terret bourret is used for making this wine. Sometimes manufacturers who desire to make very good eau de vie, take wine made from picpoule. The new red wines, provided they have not been allowed to ferment in the vat with the stalk, give also excellent eau de vie of great softness. The eau de vie of Montpellier is made with the same apparatus as that which produces

the 3/6; but it is arranged a little differently, so as to give a lesser strength. The eau de vie of Montpellier, however, is almost a thing of the past. Commerce and manufacture have given it up, and devoted themselves exclusively to the strongest kinds of alcohol which can be produced by mere distillation. The average production of 3/6 is enormous. There are annually produced 2,000 pieces of eau de vie; further, 6,000 hectolitres of 52°, and 60,000 pieces of 3/6; or, altogether, 360,000 hectolitres. The arrondissement of Béziers yields regularly two-thirds of this quantity, and sometimes three-fourths. 60,000 hectares of vineyards of l'Hérault produce nothing but wine to be used for distilling. The average production of 3/6 in the four departments—the Eastern Pyrenees, Hérault, Gard, and Aude—has been 500,000 hectolitres. The 3/6 of wines are made by manufacturers who make a distinct occupation of it, or by proprietors who have a still attached to their farm arrangements. These farm distillers are more numerous in the circle of Béziers than in that of Montpellier. The larger quantity of the wines is distilled by the professional manufacturers. They have their manufactories in the villages in the very centre of the great production, and concentrate in their hands all the disposable wine after each vintage. The manufacturing time begins with the first days of October, and continues longer or shorter according to the abundance of the harvest—sometimes for three months, sometimes for six. The first 3/6 which are distilled from the new wines are always the best. The 3/6 of murk is obtained by subjecting murk as it comes from the press, of course after fermentation, to the heat of water or steam. For this purpose, there are attached to the apparatus De Rosne two large cylindrical copper vessels, into which the murk is put. Into these a current of steam is now directed, which carries the spirit away. One vessel is charged while the other is working, and *vice versa;* so that the distillation continues without interruption. With an apparatus of the strength of four pieces, one piece of 3/6 of murk can be made in twenty-four hours. The richness of the murks in alcohol varies with the degree of desiccation and the strength of the wines which they have produced. There is no means at present for determining the amount of alcohol in murk. The manufacturers buy the murk at a fixed price, so that they are assured of having a sufficient quantity for keeping their machine going when it is once arranged.

When the 3/6 of good taste are rare or very dear, the murk is washed methodically with water. The water then takes up the wine contained in it, and this more or less alcoholic water is now distilled. It yields a spirit of good taste, while, if the murk

itself were distilled, it would have the peculiar bad taste of murk spirit. This bad taste of the murk is particularly developed when it has been kept for some time; and is, of course, a product of the putrefaction of its albuminous ingredients. It is calculated that on an average 130 muids of murk are necessary to make a piece of 600 litres of 3/6. The muid of murk weighs on an average 100 kilogrammes; 13,000 kilogrammes of murk, therefore, yield 600 litres of spirit. In the canton of Lunel many proprietors fatten sheep by means of the murk of grapes, from which in the morning they distil, by means of special apparatus, the alcohol previous to feeding. The animals then get the murk cooked and warm. The alcohol is produced gradually, and is taken to the market when the barrel is filled. The murk which has been exhausted by the manufacturers who have no live stock is used as manure.

The eau de vie, proof of Holland, 3/6, 3/5, 5/6 of Languedoc, particularly of l'Hérault, are mostly sold in France, but a proportion is exported to foreign countries.

J. L. W. Thudichum, M.D.

We are exceedingly glad to see that the *Lancet* calls attention to the necessity of dividing the country into Local Health areas. No sanitary organisation can be properly carried out, when the existing Registration areas are so totally different in size, and often locality, to the Health areas. Oxford is instanced as having a Local Health population of 28,000, which dwells in no less than three separate registration districts, one of them being in another county. The difficulty of obtaining statistics—at all times great—is embarrassed a hundredfold by this confusion, besides frequently leading to fallacious deductions. We hope, before long, to see proper Health districts mapped out according to their physical outlines, without any necessary reference to the antiquated parochial boundaries. Maps of this kind are much wanted; for even the maps of the Poor Law Board are not accessible to the public, and the greatest haziness prevails on a subject with which every good citizen should be acquainted.

The Columbia Fish Market has been opened on the day appointed, with but little ceremony, but with every prospect of success. Up to the present time business has been brisk—plaice, haddock, whiting, skate, etc., fetching 1*s.* per pad more than at Billingsgate. We hope shortly to describe the market at length.

FOOD NOTES FROM HOLLAND.

The Dutch Society for the Improvement of Industry has made a practical move to ascertain the bearings of the food question in the Netherlands, by addressing a circular to the principal householders and property owners in the various provinces. In it they request information on the following points: 1. The ordinary food in use among the working classes of each locality, and the average amount of animal and vegetable produce consumed by each family. 2. The usual price of meat. 3. The existence of public dining places where workmen may obtain a good cheap meal. 4. The daily and weekly wages of the various trades. 5. How far drinking and dissipation interfere with the proper supply of food. There is no doubt but that a most valuable amount of information will thus be gathered together, and form a reliable basis for legislation or any private efforts for improving the physical condition of the people.

A good deal of attention has been paid by Dr. Bellot, of Rotterdam, and Professor Simon Thomas, to the introduction of butter-milk as food for very young children, in conjunction with rice or wheat flour. Besides being easier of digestion, it is cheaper and less liable to adulteration than milk from the cow. Dr. Van Maanen, of Barneveld, says that butter-milk is invariably used by the children of that district, and with the best effects. They get through their infantile disorders with wonderful celerity. Scrofula is unknown, and the bills of mortality are reduced to a minimum; all owing, according to the Doctor, to the use of butter-milk.

From enquiry made by ourselves during the Amsterdam Exhibition, we obtained the following information as regards the city food supplies. Of *meat* the poor see but little; and what they do buy, they procure from the costermongers, paying them the same price for inferior meat without bone as they would pay for the best meat with bone. The Jews, of whom there is an immense population in Amsterdam, are the principal customers for the livers and tripes. Mutton is 6*d*. and beef 7½*d*. per lb., but it must be remembered that the Dutch pound contains an ounce more than the English. The principal meat supplies come from North Holland and Gelderland. Two sorts of rye *bread* are eaten; the

one hand-made, the other by machinery. The wealthier classes prefer the latter, which is of much darker colour, and smells somewhat like gingerbread. The working classes, on the other hand, like hand-made bread best, because it is whiter,—a popular taste which finds its counterpart in this country. There is no real difference in the quality of the rye, but there is in the baking, the hand-made bread being left in the oven for 24, while the machine made is left for 48 hours. Holland, although a grain-growing country, cannot supply enough for its requirements, and has to import largely from Dantzic and Russia. The principal *fish* supplies come from the Texel, whence, by the Netherlands canals that permeate the country, well-boats bring the produce, principally consisting of soles, haddocks, flounders and herrings, to Amsterdam. The boat owners, on arrival, repair to a particular beershop, where the fishmongers meet them before the opening of the market. Ice is very largly used, and what fish is not sold at the close of the market is at once salted and sent off by train to Germany. Towards the end of the season the Jews become the largest customers to the fishmongers, especially in the purchase of haddocks, which they buy at 5*s.* per 100, and flounders at 3*d.* per lb. Salmon is dear and realises a good profit, the fishmongers buying it at 2*s.* 6*d.* per lb., and selling it at 5*s.* Trout is very scarce, but pike and perch are tolerably plentiful; and it is a curious fact that these are the only fish which are protected in Holland by fence months, which last from March to May. *Vegetables* are very largely consumed, and especially salad, when the season has pretty well advanced, though at the beginning it is too dear for the poorer classes. Potatoes are of two kinds, those grown in the sand dunes and those grown in the clay; the latter are by far the most common and the cheapest, though the others are considered to have the finest flavour. Spinach is cultivated very extensively in the neighbourhood of Utrecht, and a favourite dish with the Dutch is one of spinach and sorrel eaten together. Careful housekeepers buy a lot of white cabbage at the beginning of the season, and make Sauer Krout of it, by placing it in a cask with alternate layers of salt. The salt soon dissolves, and the bulk decreases nearly one half, when more is added, until the cask is full. Sauer Krout is a favourite dish with the poor, who buy it at the street-stalls for ½*d.* a lb.

P. B.

THE SANITARY STATE OF THE STAFFORDSHIRE POTTERIES.

The localisation of a manufacture is usually brought about by the existence of the raw material on the spot, by the convenience of a place for the importation of that material, and for the exportation, or for the direct sale of the manufactured product; or, by the abundance and cheapness of labour generally, and of skilled labour particularly; and, as subordinate, by the presence of some individual possessed of exceptional talent in developing and fostering a manufacturing process. More or less of such causes concur in securing such a localisation.

The Staffordshire Potteries are the great centre of the manufacture of china and earthenware for the world; yet it would be difficult to fix on the causes that have brought this to pass. The essential raw materials of the manufacture, the clay and the flint, are not found on the spot, but have to be imported from the distant counties of Dorsetshire and Cornwall. The locality is inland, near no navigable river, and badly situated for both export and import; and it commands the custom of no neighbouring large towns for its products. When the potting trade arose in it, it was a thinly-peopled, moorland country, and skilled labour was not to be found. The earliest attempts to make crockery were of the rudest character, and the clay-marls of the district supplied the material for the coarse ware that was hawked about in surrounding villages. Still there was nothing in the locality, until about a hundred years ago, that would have aroused a suspicion that it would become the seat of a most important branch of the manufacturing interests of the country. That it has become such is due rather to secondary causes, found in the genius and skill of individuals, who, utilising the lesser advantages available in the district, have struck out new processes of manufacture, have attracted labour and capital, and opened out new channels of communication and of commerce. Foremost and best known among such men was the celebrated Josiah Wedgwood.

North Staffordshire, however, possessed one important element needed for the development of the pottery manufacture, and without which that manufacture could not have existed at all. This element was the presence of coal in abundance, and of the quality suited to the manufacturers. Yet as such fuel existed elsewhere in

abundance, it can be regarded as only a secondary cause for the localisation of the pottery trade. The same may be said of the marl largely used in making the coarse cases—technically called "saggars"—in which the china and earthenware are "fired."

The general aspect of North Staffordshire is hard and less cheerful than that of the southern counties of England. In configuration it is hilly, and though intersected by no large river, is watered by several streams which take their rise in the neighbouring hills, and for the most part contribute to form the river Trent. The soil is usually a retentive clay or clay-marl, and, where undrained, gives rise to boggy, marshy ground. On the west side of the hills lies the flat country of Cheshire; and, consequently, the rainclouds arising from the Irish Sea, having been driven by westerly winds over that lower tract of land, impinge on the hills of Staffordshire, and are precipitated over the cold clay region around, giving rise to a rainfall above the average of many other English counties.

The climate, being moist and cold, predisposes to rheumatism, catarrhal affections, and consumption. The pottery towns contain a population of about 150,000. They are comprised in two Poor Law Unions, Stoke-upon-Trent and Wolstanton. The towns themselves are widely spread, and chiefly occupy a hilly ridge running north and south, and of some nine miles in length. Stoke proper is one of the smallest of the towns; and, unlike the rest, is situated in a valley, through which the Trent—there only a shallow stream—runs. It therefore is most disadvantageously placed for drainage, particularly as the fall of the river is inconsiderable, and the land on each side flat for some distance. On the other hand, the other Pottery Towns—Hanley, Shelton, Fenton, Longton, Burslem, and Tunstall—are well placed for carrying out a thorough system of drainage. But though this be the case, their drainage is most sadly neglected. In no one town is there a complete system. In Hanley no plan of sewerage has been attempted; cesspools are the order of the day. Even the surface drainage in many parts of the towns is unattended to. Numerous are the bye-lanes and streets without footpaths and kerbs, and without channels for the water, except such as it perchance cuts for itself. The high roads are remarkable for general unevenness, for loose, gritty dust in summer, and for black slush in winter. The atmosphere is more or less beclouded by smoke from the thousands of ovens and chimneys, supplemented by that from iron furnaces, and by the sulphurous vapours from heaps of iron-stone in process of calcining on the surface of the ground. The Trent, and collateral streams, and the canals, that should brighten and diversify the surrounding land-

scape, are polluted by sewage and refuse thrown into them from adjoining houses and factories, and so become the source of bad odours and of disease.

The water supply of all the towns is in the hands of a single company, which is unable to give a constant supply anywhere; and in many parts which are at a higher elevation than the rest, affords a most intermitting supply at short periods, leaving the inhabitants in dearth of the water necessary for health and cleanliness. Improvements devised for the common good of the whole district are prone to be thwarted and rendered abortive by jealousies subsisting between the several towns, each one of which boasts of its own mayor or high-bailiff, with its Board of Health or other committee charged with sanitary functions. The perpetual changes among the members of the local boards, their mode of election, and the influences that regulate such elections, supposed local interests, and the dread of taxation, are, in the Pottery district, as in other English towns, inimical to sanitary progress, but operate with greater power in a congeries of towns such as is presented, and is perhaps unique, in the Staffordshire Potteries.

The inhabitants of these towns are of a mixed race. The substratum of the population is of Saxon origin, having a fair, fresh-coloured skin, brown hair, wide faces, rather high-cheek bones, large eyes, and wide mouths with full lips. Intermingled with it is a large number of natives of Wales, and of the descendants of such; and, of late years especially, the Irish element has greatly increased. The Welsh race are more particularly engaged in colliery work; the Irish, as elsewhere, supply the lower sort of general labour; whilst the Saxon population is chiefly devoted to the special occupation of the district, in making earthenware and china. The manufacture of iron has of late years made rapid strides, and has attracted large numbers of workmen from South Staffordshire.

There should be but little "poverty in the land;" but, unhappily, there is much wretchedness, the consequence of ignorance, recklessness, and dissipation. The wages are good, both for the workers in clay and in iron. The Pottery trade especially affords employment for large numbers of children and women, besides adults; so that the possession of a family may be rendered a source of wealth. In the iron trade the wages that the workman can obtain are almost fabulous, considering how little skill is demanded, and that the work done is simply mechanical, requiring bodily labour of the coarser kind.

"Week-end," that is from Saturday until Monday,—it may be a later day in the week if the money and credit hold out,—is the season

of dissipation. In that interval the wages made by the unsteady workman during the three or four days he may have chosen to devote to work are expended in sensual indulgence; and probably the proceeds of some hoped for future days' work are also pledged in anticipation, to prolong his dissipation. Comparing the number of public-houses and of beershops with the population of the towns, it may be safely asserted that there is one house for the sale of intoxicating drinks to every 150 of the inhabitants.

At the end of the week the well-filled pockets of the artisans, particularly of the workers in iron, enable them to indulge both in free potations of alcoholic drinks, and in choice fare; in procuring for themselves not only butchers' meat, but poultry and vegetables also, as soon in the season as obtainable from the shops, without regard to cost. This recklessness in living, the intemperance and lost time, involve not only debased morals and frequent misdemeanours, but wretchedness in home and family; so that many a household that can secure two, and it may be several more pounds per week by moderate work, is in a state of destitution, as far as regards clothing and furniture, and the ordinary decencies of life, that would not be credited unless witnessed.

It would, however, be doing an injustice to the population of the Potteries to apply the foregoing statements to it as a whole. Although intemperance, irregular labour, and self-indulgence, be lamentably too prevalent, there is a moderately large number of steady, sober, and frugal workmen who have comfortable homes, and who advance themselves and their families in life. The existence of such men is shown by the establishment of flourishing building societies, of which they are the chief supporters, and also by the fact that a *very* large proportion of the master potters, occupying the position of manufacturers, consists of men who have risen from the rank of workmen.

The mortality of Stoke and Wolstanton—the two large parishes within the area of which the several Pottery towns are situated—stands high compared with that of English towns generally; although, indeed, it is equalled by several manufacturing cities, and surpassed by a few. According to the reports of the Registrar-General, the average annual mortality in the particular towns in question, from all causes, is twenty-six to every thousand persons living. On examining the causes of this heavy mortality, attention is at once directed to the great destruction of life by pulmonary consumption and chest diseases, and to the extraordinary mortality (above fifty per cent. of the whole number of deaths) among children under five years of age. The prevalence of chest

diseases and phthisis has, on more than one occasion, been brought under public notice by special inquiries instituted under the sanction of Parliament. The results of those inquiries—most admirably carried out by Dr. Greenhow—are embodied in the "Papers relating to the Sanitary State of England," published by the General Board of Health, in 1858, and in the "Third Report of the Medical Officer of the Privy Council," for 1861.

A subsequent and very extended investigation made in relation to the excessive mortality of children, and the circumstances of labour in the earthenware and china manufacture, was conducted, in 1862, by the "Children's Employment Commissioners," who printed the minutes of evidence taken *in extenso* in a bulky blue-book, the "First Report of the Children's Employment Commission, 1863."

The most prominent facts elicited by this inquiry were, that children were sent to work by their parents at an unduly early age; that, being hired by the workmen, their employment was under no supervision and control, and that, consequently, they were sadly overworked, kept to late hours at night, and allowed no proper time for meals; that their education was wellnigh altogether neglected; that, with regard to adults, they worked at irregular hours, often at night, and under conditions and circumstances of labour destructive of health, and unfavourable to their moral well-being.

The practical result of the work of the Commission was the extension of the provisions of the Factory Acts, with certain necessary modifications and amendments, to the earthenware and china manufacture. This piece of legislation has already borne fruit in a manifest amelioration of the conditions of labour; in regular hours of labour, and greater regularity in work; in the sanitary improvement of workshops, and in the extension of machinery calculated especially to save undesirable labour for children; in securing fixed hours for meals, and in putting an end to night and to most "overtime" work; in protecting children from excessive labour, and in withdrawing the too weak and the too young from labour altogether; and last, but far from least, in promoting the education of children under thirteen years of age by the "half-time system" of work. The improvement in the education of the children in the Potteries, as a consequence of the extension of the Factory Act, is one of the most evident and cheering facts of the day. A parallel improvement in the general *morale* and *physique* of the inhabitants generally, following from ameliorations in the circumstances of labour, can be looked for only after a much longer period, and under the influence of advancing intelligence and moral perception.

J. T. Arlidge, M.D.

CHESTNUTS INSTEAD OF CORN.

"All hot chestnuts! Ten a penny!" greets us now at every corner in the crowded thoroughfares of this busy city. Little heed is given to the cry; some persons buy a few, and there the matter ends. Yet these nuts afford ample food for thought, conversation, and action. First, the adventurous purchaser will recollect a very heavy sensation on his chest after he had finished his tenth and last chestnut. They were decidedly very hard, and not over agreeable, except, albeit, an infinitesimally small portion of one or two out of the ten nuts. This was soft and floury; it melted in the mouth, and left behind it a delicious though simple flavour. Evidently something was to be done with those chestnuts; they had not been cooked well or enough. More care, more art, and they would make an excellent and a useful dish. How is it they are so badly cooked in the London streets, when any one from Paris can testify how well the Swiss hawkers cook them there? Besides, they can be boiled as well as roasted; indeed, some persons prefer them so. It is at least an optional matter; but we in London have no choice, unless we cook them at home. And further, they can be candied, then flavoured with vanilla, and the delicacy of a sweetmeat thus made is incomparable. In London, however, the public at large knows nothing of these pleasures which art, combined with nature, affords us. Though only last autumn the chestnuts were falling again, ripe, full and luscious, from their trees, yet they were absent from our dessert tables, for we have no cooks who know how to cook them. A few rough-and-ready boys throw them in the cinders and burn their fingers to pull them out again, and that is all.

These are, however, minor considerations. Their nutritious properties, and their possible usefulness as a cheap alimentary substance, supply a more valuable train of thought. But at the outset we are met by the thrifty housewife, who little heeds "nutritious properties" contained in a fruit doled out to her at ten a penny. Fortunately, even in London, by seeking in some modest quarter, they can be bought uncooked at twopence and twopence-halfpenny a pound. Were a penny for ten a reasonable charge, we should find in each street boy, as he runs along with his fire glowing on

his head, and his chestnuts roasting above, a glaring mockery of our vaunted civilisation,—of our material, mechanical, and scientific progress. What, however, are the facts? Simply that whole populations depend on the chestnut for their sustenance. The chestnut constitutes the chief alimentary substance consumed by the mountaineers of the Alps. It is called "the bread tree of the French mountains," where the inhabitants feed on it for six months in the year. These are not the only countries where it is used as the cheapest article of food, for it is also employed by the Red Indians of America, the people of Italy, the inhabitants of the banks of the Rhine, and in many other places too numerous here to mention. Now, the railroad, an unmistakable branch of our progress, goes through, over, under, and in the close proximity of these chestnut districts. There is no more difficulty in transporting chestnuts than corn, and they cost much less. Any exorbitant charge might be understood if we were dependent on our home growth; but railways would be of little use if they could not convey articles so easy of transport. The street boy and his "ten a penny" must not be taken, therefore, as an index of the market value of chestnuts. As easy to bring over, of less intrinsic worth in the localities where grown, the chestnut should be sold in England at a price considerably under the charge for corn.

Without the aid of science, or any knowledge of its chemical properties, poor ignorant peasants in many countries have known how to make good use of the chestnut. Seeing that the crop, as a rule, is abundant only every other year, great care is taken to preserve them. For this purpose a certain quantity are shaken from the trees, while those required for immediate consumption are, on the contrary, considered better when allowed to drop of their own accord. The chestnuts that are destined to be preserved are placed in layers of dry sand, cinders, or some other similar substance. The remainder are dried by slow fire, and the husk is here usefully employed as fuel for this purpose. The dry chestnut is then ground into flour, and with it, bread, cakes, or puddings are made. The bread is naturally more heavy and indigestible than if made with corn; but even heavy bread is better than no bread, and it is a question whether it is more weighty than the "fatty" or "duffy" puddings which our poor are in the habit of buying at a halfpenny or a penny a slice. Indeed, some authorities, perhaps more robust in their digestive faculties, consider it as a pleasant and wholesome article of food; and, in all cases, it is a fact that, in many families on the Continent, the chestnut effectually replaces both bread and

meat. Might not, therefore, the dry chestnut, if imported, be made to reinforce our never too abundant supply of corn? If so useful already, might not the investigations of our Baron Liebigs discover for us some new and better means of appropriating it? The mere fact that the chestnut is used instead of corn and of meat speaks volumes; and, should the matter be taken up, railroads and chemistry will make small matter of the difficulties of transport and preparation.

If, however, objections are raised to making food of the chestnut for our poor, none could be urged against its use as food for our cattle; and the corn which they now consume might be thrown into the market to lessen the price of ordinary bread. Raw, cooked, or macerated, the chestnut is eaten with pleasure by the horse; it gives him strength and vigour, and a meal or two of this food will soon restore him after over-work. By pigs and farmhouse fowls it is equally appreciated, and always produces good flesh. Finally, when pounded, dried and scorched, alone or mixed with beetroot, it can be used in the stead of coffee. The husk of the chestnut may serve also as food for the ox. The utility of the chestnut is so various, that surely this matter should no longer be neglected. There is, of course, a strong prejudice against all that is new; but against such groundless antipathies it is the duty of all to struggle. Let our cattle know more of the chestnut, and our poor will become better acquainted with bread. But, as ordinary every-day food for man, the chestnut must be tried with skill and persistence. Why should not, for instance, our penny dinner establishments set the example? With an increased demand there will be a greater supply, and at a cheaper rate. As for the means of cooking it, ground chestnuts can be used much in the same way as ordinary flour; and, if any tradesman will provide a little of this chestnut flour, the staff of the "Food Journal" will not fail among them to find out some good receipts.

Adolphe Smith.

The oyster dredging in the Firth of Forth has been attended with indifferent success. The number of oysters every man is entitled to land each day is from 400 to 500, but the take for each member of a boat's crew seldom exceeds 200. The prices obtained for them at public auction is from 4*s.* to 5*s.* per 100 in large lots.

DOMESTIC RECIPES.

The Editor desires to appeal to his readers, and especially to the ladies, for contributions of recipes for cheap, tasty, and serviceable dishes, both for poor households and those of the higher classes.

THE "FOOD JOURNAL" SOUP.

This is a most excellent and economical soup for poor people For one quart of soup, fry three onions in dripping, about the size of a walnut; then take half a carrot, and cut it up in small pieces, with one turnip, half a dozen potatoes, a little salt, pepper, and white ginger. Boil them together for four hours, very slowly. The cost is a little over a halfpenny a plateful of half a pint.

SPINACH FRITTERS.

Boil some spinach thoroughly, drain it well, mince and add some grated bread, nutmeg, ginger and cinnamon, all pounded; add as much cream, or yolks and whites of eggs, as will make it of the consistence of batter; scald a few currants, and mix them in. Drop the batter into a frying-pan, on boiling lard, and as soon as the fritters rise take them out, drain, and serve.

POTATO PUDDING.

A few potatoes must be well boiled, and mashed fine, with a little milk, then sweetened to taste, and pressed into a pie-dish. Beat one egg, and lay it on the top, with a little grated nutmeg, and bake for half an hour.

POTATOES FOR NURSERY DINNERS.

Stir new milk into mashed potatoes till the mixture is as thin as double cream. Boil this with a little butter, pepper, and salt, for ten minutes.

WINTER HOTCH POTCH.

This dish may be made of either fresh beef, or of a neck or back ribs of mutton, or of a mixture of both. Cut 4 lbs. of meat into handsome pieces. Boil and skim well, add carrots and turnips

sliced, small leeks and parsley cut down, and some German greens shred; and, if tender, put in only half an hour before the soup is completed. Season with pepper and salt. The quantity of vegetables must be suited to the quantity of meat, so that the soup may have consistence, but not be disagreeably thick. Serve the meat and soup together. Have, if you like, rice, or dry but melting green peas, boiled in it, which last is an improvement.

BREAKFAST DISHES.

Omelette with or without herbs, and a layer of minced mutton or other meat, is a favourite dish for breakfast. Also sandwiches made of hot toast and bacon between, with or without anchovy paste. A young rabbit cut up and fried is much liked. Minced mutton or beef, with bread-crumbs and clarified butter, salamandered, also make a change, in addition to kidneys and the remains of poultry and game, which all come in for breakfast dishes.

The following amusing recipe for a dish of frogs is taken from a collection in Lady Llanover's excellent cookery book:*—Take the thighs and fry them in clarified butter, then have slices of salt eel watered, flayed, boned, boiled and cold; slice them in thin slices, and season both with pepper, nutmeg, and ginger; lay butter on your paste, and lay a rank of frog and a rank of eel, some currants, gooseberries, grapes, raisins, pineapple seeds, juice of orange, sugar and butter; this do three times; close up your dish, and when baked, ice it. Make your paste of almond milk, flour, yolks of eggs, and sugar. In the aforesaid dish you may add fryed onions, yolks of hard eggs, cheese curds, almond paste, and grated cheese.

FOR PREPARING INDIAN MEAL.

While the maize is yet green in the ear, it becomes by boiling a delicious vegetable for the table; and when ripe it is capable, before it is ground, of being prepared for food in a great variety of ways. It makes its appearance in every form,—from gruel, stirabout, and pan-cakes, to bread in twenty different shapes. In no form in which it is ever used in America is it eaten cold. When wanted in the shape of bread, no more is baked than is necessary for the time being; it is never baked in large quantities, and in the shape of loaves, as

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* "Good Cookery," by the Right Hon. Lady Llanover.—Richard Bentley, 1867.

ordinary flour is baked into bread. Nor is it mixed with any kind of flour or meal. Indian corn is always best when used by itself, with the exception of such ingredients as eggs, butter, milk, sugar, etc., which are frequently added in its preparation, to give it richness and flavour. It is really never so sweet as when made in the simplest way. In preparing it for their own uses, the negro women generally mix it with water and a little salt, the dough which is thus formed being made up into a roll about the size and shape of a soda-water bottle without the neck. This is enveloped in the hot ashes of a wood fire, which is the simple process by which it is baked. When ready, it is taken to the pump, and, whilst yet hot, the ashes are washed off it. When they wish to be a little particular, they protect it by wrapping it in leaves before covering it with the ashes. The bread produced by this means is, whilst warm, exceedingly sweet. Indian meal should never be ground too fine It should not have much salt, which spoils its native flavour. It requires a hot oven, or, if baked upon a girdle, a hot, clear fire. It takes longer to bake than wheaten flour bread; and, if boiled, much longer time than oatmeal. For boiling, the more coarsely it is ground the better, if it is long enough boiled. It is sufficient that it is husked. For hominy (a good substitute for rice) the corn is simply hulled or cracked at the mill, and any inevitable meal is afterwards sifted out; or the skins are got rid of by pounding the corn in a mortar and sifting it—a tedious process. Indian corn roughly ground may be used for force-meat, instead of bread-crumbs. It makes tolerable gruel.

SCOTCH BROSE.

This favourite Scotch dish is generally made with the liquor in which meat has been boiled. Put half a pint of oatmeal into a porringer with a little salt, if there be not enough in the broth, of which add as much as will mix it to the consistence of hasty-pudding, or a little thicker. Lastly, take some of the fat that swims on the broth, put it on the crowdie, and eat in the same way as hasty-pudding.

MADRAS DRY CURRY.

Cut one pound of meat into small pieces, slice one onion and fry it in butter to a light brown, then add one tablespoonful of Madras curry powder, one teacupful of water, one breakfastcupful of gravy, the juice of one lemon, and a little salt; stew all together till nearly dry, and send it up quite hot.

THE ECONOMIC USES OF BRICK TEA.

The utilisation of the refuse of the tea manufacture is a feature in Chinese economy which well deserves the attention of our Indian planters; and the admirable product resulting from it claims the attention of philanthropists both there and at home. It is well known that, from the prolonged manipulation which tea leaves undergo, a largepe rcentage becomes much broken, or is reduced to powder, and thereby deteriorated in value. It may seem strange to many why tea dust and siftings should be considered as refuse at all, seeing they are still tea; more especially when, as a rule, they yield a stronger infusion than the finest and most perfectly curled leaves. This apparent incongruity disappears, however, on closer investigation. When in the form of dust its liability to adulteration with sand or other heavy foreign substance is vastly increased; and, as siftings, fannings, or broken leaf, an irresistible temptation is offered to the introduction of the broken leaves of other less valuable plants. Then again the darker infusion is usually obtained only at the first maceration, the boiling water so acting on the pulverised leaves that nearly their whole strength is extracted at once; whereas, with closely twisted leaves, a second, third, or sometimes even a fourth infusion fails to deprive them of all soluble material. Under such circumstances the Chinese merchant, in order to encourage business in good leaf, frequently sells his dust and siftings at a low figure, if not at a price under cost. But it happens that a vast quantity of refuse is produced in a district of the Empire so remote from the "Treaty ports," where alone business can be profitably transacted with foreigners, that some other opening had to be discovered. Such an outlet the Chinese speedily found in the manufacture of brick tea for the Russian market.

This strange phase of the fragrant herb takes three forms:—Large Green, Small Green, and Black Bricks.

The large green variety is manufactured in the hilly regions in the province of Hupeh, about two hundred miles west of Hankow. It is fabricated out of the coarser leaves and upper twigs of the *Thea virides*, to which are added much of the broken leaf and dust

resulting from green tea manipulation. The mass is simply moistened by the application of steam, then compressed in wooden moulds, having the chop of the manufacturer cut in relief on one of the inner surfaces. The bricks are then piled up in stacks protected from the sun and rain, but having a free current of air circulating through and around them. When quite dry, each brick is enveloped in paper; thirty-six bricks, built into an oblong figure, are covered with dry fragrant leaves, and the whole matted over. Such packages are known as "baskets."

In colour this form of tea exhibits a dusky green, and is now made to a large extent by the Russian agents of the Kiachta merchants. It sells at Kiachta at about three roubles (1 rouble = 3*s.* 2*d.* sterling) more per basket than that made by the Chinese; but then it should be remembered it costs the Russian agents from 50 to 75 tael cents (1 tael = 6*s.* 8*d.* sterling there) more at Hankow. Large green bricks measure 13 × 6½ × 1½ inches, the weight of the basket being about 83 catties, or nearly 111lbs. Avoirdupois.

Unlike the method employed in Mincing Lane for testing the quality of tea, the Mongol buyer proves the soundness of his purchase by placing a brick upon his head and pulling the extremities downwards with both hands; should it neither yield nor break it is considered sound; if it bends or fractures it is unhesitatingly tossed aside as worthless. Occasionally a similar test is practised over the bended knee.

Among all the native inhabitants of Mongolia, and a large number of the Bouriats who live in the neighbourhood of the Russo-Mongolian frontier, this description of tea is in favour. The chief markets are Chang-kia-kow, Ourga, and Kiachta.

Small green brick tea is always superior to large, from the simple circumstance that much greater care is bestowed on the selection of the materials, and during the manufacture; consequently, it commands a higher price, although its fabrication is similarly conducted. It is consumed by the Siberian peasantry and the better class of Bouriats and Toungous resident near the Mongolian frontier. Even the Mongol mandarins, both in their native country and when attached to the court at Pekin, prefer this tea. The usual size of the bricks is 8½ × 5¼ × ⅞ inches, and the principal emporiums for their distribution are Kiachta, Chita, and Nerchinsk.

Neither of these two forms of brick tea undergo fermentation. Black brick tea, named in Mongolia "Dirintirroo," is made into cubes of the same size as small green. It consists of siftings, fannings, and the dust resulting from the preparation of Moning and Kaisow teas for the London market, with an admixture of

Bohea and small twigs. Like small green, it is usually packed with 64 or 72 bricks in a basket, and is in request among the Tartars or Khirgis of Western Siberia. Large quantities are also sold to the peasantry residing on the western shores of Lake Baikal. The native markets are Kiachta, Irkoutsk, Omsk, Tomsk, Kazaw; and Nijne Norgorod and Irbit, during the fairs.

The average prices obtained by the Russians at the markets stated are as follows:

Sort.	Basket of	Per Basket.	Weight.
Large green bricks	36 bricks	4 Taels	111 lb. Avoird.
Small green ,, ...	64 ,, ...	4 ,, ...	93½ ,,
Small black ,, ...	64 ,, ...	4½ to 5	93½ ,,

As already mentioned, the brick tea of Chinese manufacture fetches a rather lower price.

A few statistics may prove instructive, especially to such of our Indian tea planters as, from the favourable position of their gardens, may in future have opportunities of cultivating the brick tea trade in competition with the Russian merchants.

The commerce, until within the last nine years, was wholly in the hands of the Chinese; but, forecasting events, and depending on the superiority of European to Asiatic manipulation, the Russian merchants of Kiachta boldly sent their own agents to Hupeh, who have not only succeeded in producing a better quality of tea, but have since then monopolised a considerable percentage of the brick tea trade. This no doubt arose partly from the fact that foreigners possess an advantage over the Chinese, inasmuch as they are not mulcted in such heavy inland duties. To show the extraordinary progress made by the Russians, it may be mentioned that in 1865, only two years after they commenced the manufacture, their agents forwarded to Kiachta 15,000 baskets, whilst the Chinese during the period received only 30,000 at their old established emporium at Maimaichin, 150 yards from Kiachta; in short, the quantity of Russian manufactured brick tea which crosses the frontier is annually increasing, whereas that made by the natives is as steadily on the wane.

The sales at Ourga, the capital of Mongolia, about 200 miles from Kiachta, are said to be upwards of 50,000 baskets per annum (over 5,000,000 lbs., or more than half the entire produce of our Indian tea gardens), of which nine-tenths are large green brick.

The Chinese transport the greater portion of their brick tea overland, *vid* Shansi, whilst the Russians invariably send theirs *vid* Shanghai and Tientsin to Kiachta, whence it is transported to Siberia, Tartary, and Russia, on the backs of camels.

In Mongolia and Tartary the method of preparing brick tea for drinking is unique, and is suggestive of a cheap and admirable substitute for food during times of commercial distress and famine, which we heartily recommend to the guardians of the poor at home, and to the Government of India.

It is rubbed to fine powder, boiled with alkaline steppe-water, to which salt and fat have been added, the decoction being carefully decanted. Of this liquid the nomadic races drink from twenty to forty cups per day, mixing it first with milk, butter, and a little roasted meal. But even without meal, they subsist upon the beverage, and maintain perfect health and a robust physique for many weeks in succession.

It is not illogical to argue, from the foregoing, that the use of brick tea, prepared in a similar manner, and introduced into our various unions, casual wards, and prisons, in a country less exposed to climatic severity than the steppes of Tartary or the wintry solitudes of Siberia, would be productive of economy; not to mention the deterrent influence that such unusual fare could not fail to exercise on the class of people habitually finding their way to these refuges.

William Cochran, M.R.A.S.

The *Gaulois* gives a list of the good things which the Emperor provides for his guests on the night of a grand ball at the Tuileries. The supper is laid out in the Salle de Diane, and a dozen of the Cent Gardes keep watch and ward lest any one intrude before the hour of the repast. Shortly after midnight the Emperor makes a tour of the ball-room, addressing a few words here and there to some favoured guest. At one o'clock he retires, and the doors of the Hall of Diana are thrown open. The bill of fare includes 900 bottles of champagne, 400 of claret, 50 bottles of Madeira, 1,200 litres of syrups, 200 of hot chocolate, 2,000 ices, 1,200 litres of punch, 3,000 cakes, 100 pasties, 1,200 lbs. of cold meats, 100 *patés de foies gras*, 200 chickens, 50 pheasants, 100 partridges, 12 hares, 3,000 larks, 24 *entrées* of fish, 24 salads, 20 fillets of beef, 3,000 rolls, besides the coffee, etc. In little more than an hour everything has disappeared. No wonder, says the *Gaulois*, that on one occasion a set of false teeth was found on the floor after the guests had departed!

NOTES OF THE MONTH.

The statistics of the Board of Trade, lately issued, contain some items of information of rather serious import as regards the meat supplies. It seems that in 1869 we possessed 700,000 cattle, 350,000 pigs, and 1,110,000 sheep less than we had in 1868. On the other hand, there was a considerable increase both in corn and grass crops. The number of acres under corn crops in 1869 was 7,785,033, as against 7,499,218 in 1868, while the average of the green crops was increased by 174,079, a large proportion of which consisted of peas.

A new utilisation has been discovered of the beech tree, which hitherto has only served the ignoble use of feeding pigs. From the seeds of the pods, which fall in numerous quantities in the Holstein forests, an oil is expressed, which makes a finer and cheaper salad oil than that of Lucca, ordinarily in use.

Tea and moss up to the present time have not been regarded by total abstainers as containing any intoxicating properties; but for the future they will be looked upon with considerable suspicion. "The cup that cheers, but not inebriates," has been found by Dr. Thudichum to be capable of yielding a very excellent wine, wholesome and pleasant to the taste; while M. Stenburg, the Professor of Chemistry at Stockholm, has succeeded in extracting, by distillation, alcohol and brandy, from the Iceland Reindeer Moss. The starch, which it contains in large quantities, is transformed into grape sugar, and subsequently fermented. The value of the discovery lies not so much, perhaps, in the production of the alcohol as in the substitution of the Iceland Moss for other and more valuable grain crops, which are at present grown solely for distillation. In the interesting lecture delivered before the Society of Arts, in which Dr. Thudichum brought forth his tea wine, he mentioned the unpleasant fact that very many sherries contain sulphite of potassium, which adds to the bitter taste, and is frequently purgative. He advises us to stick to three wines on our tables—a clear sound wine for thirst; a delicate wine, such as Burgundy or champagne, for tickling the palate; and, after dinner, claret or good port. If Dr. Thudichum would go a little further, and tell us where to get the latter, he would make us for ever grateful.

The following hints on egg preserving may be useful:—One plan in New York is to pack them in salt, the small end down; another method (said to answer admirably) is to fill a bucket with them, and dip them into hot water for thirty seconds. In Russia the eggs are put into a keg, and heated lard is poured on them, so as to fill the interstices, and thus prevent evaporation.

The saying that "they do things better in France," is exemplified by the Mayor of Douai, who has issued an order prohibiting the bakers from using old railway sleepers as fuel for their ovens, it having been found that they were strongly impregnated with sulphate of copper, which might possibly enter the bread, and be exceedingly injurious to the consumer. In this country all the sleepers on the railways might have been used, before any power would have been brought to bear upon the bakers.

Kent is nobly leading the way to a reformation which is much needed—that of our agricultural labourers, for the majority of whom the temptations of the low beerhouses, existing in every village, are too powerful. While the husbands are besotting themselves, the families are starving, and the whole household learns to regard the parish as their ultimate destination. An association has been formed in the county to watch and restrain the further multiplication of beershops, to promote village industrial meetings, and to extend the garden allotment system. With the exception of the public-house owners, there can surely be no objectors to so philanthropic a scheme, which we heartily hope may be imitated by every county in Great Britain.

Not the least valuable of the publications at the commencement of the year is the report by Dr. Letheby on the sanitary condition of the City of London. Notwithstanding the general outcry which has been made of the scarcity and defective quality of the water supply, it is reassuring to know that in both respects we are better off than the Parisians; London being supplied with a daily average of 99 million gallons (equivalent to 31 gallons a head), while Paris has only 24 gallons a head, even this quantity including the profuse requirements for the public fountains and ornamental gardens. The following is the melancholy roll-call of provisions seized and destroyed by the inspectors during the year, as being unfit for human food:—6,395 sheep and lambs, 662 calves, 271 pigs, 761 quarters of beef, 2, 184 joints of meat, 1,143 cans of preserved

meat, 11 boxes of rabbits, 2 boxes of hares, 17 deer, 17 haunches of venison, 23 hares, 1,034 rabbits, 512 head of poultry, in all, 191,283 lbs., of which 62,689 lbs. were absolutely putrid. The seizures of fish were:—1,126,181, besides 11,425 gallons of shrimps, 1,395 bushels of periwinkles, 364 bushels of mussels, 912 bushels of sprats, and 293 bushels of whelks. This statement is appropriately followed up by the names of the offending graziers and butchers who have been convicted for selling diseased meat. We should like this list made thoroughly public, and extended so as to include the name of every tradesman who was detected in adulterations of food, or in using false weights.

The results (and very satisfactory ones) of a most interesting development of a new trade, may be seen in a handsome block of buildings in St. Petersburgh Place, Bayswater. They have been erected by the Aylesbury Dairy Company, for the purpose of storing and distributing their daily supply of milk, which arrives by rail from the rich grass lands of Buckinghamshire and Wiltshire. In whatever way they are considered, these buildings are well worth a visit, partly from the nature of the business and the extraordinary reformation which is being gradually caused by it and a few similar undertakings in the London milk trade, and partly because it is an instructive example of the ease with which the workmen and their families, employed by the Dairy Company, are comfortably housed in the same block as that in which their work is carried on.

The opening of the Suez Canal is likely to affect English exports and imports prejudicially in some quarters, if it has not already begun to do so. A large trade has long been transacted in Mincing Lane in high-priced teas, which, being too costly for the English market, are sent to Russia from this country. Now, however, the teas will go direct, *viâ* the Suez Canal, to Galatz and the Black Sea, and thus a considerable amount of trade will be diverted from us.

We observe from the last annual report of the Boys' Home in the Regent's Park Road, that, while the average net cost per head of each boy in British Reformatories for boys is £18 19*s.* 10*d.*, and, in the Union Workhouses, £24 10*s.* 1*d.*, the average net cost of each boy in the Boys' Home is only £15 1*s.* 2*d.*, the result of each boy's labour having averaged £5 9*s.* 1*d.* during the past twelve months.

THE

FOOD JOURNAL.

THE BEET-ROOT QUESTION.

A NEW industry has, within the last three or four years, been silently growing up in this country, which, though little known to the general public, bids fair to take deep and permanent root amongst the productions of the soil, and ultimately to exercise a considerable influence on the food resources of the kingdom. This industry consists in the cultivation of the beet-root, which, hitherto familiar to most people only as a simple garden vegetable, is fast becoming one of the most valuable adjuncts to the farmer, who finds in it not only a safe outlet for his capital, but also an extraordinary economy for his cattle feeding, and a profitable employment for his ground, men, and horses. Originally looked upon as one of those interesting little experiments in which analytical chemists delight to dabble, the beet-root cultivation, with its subsequent destinations of sugar making and distilling, is now gathering within its radius the practical knowledge of the agriculturist, the speculation and boldness of the capitalist, and the science of the manufacturer. As a deeper ploughing loosens the hard subsoil of the ground, so is the enquiring spirit of the country quickened by these applications. The farmer begins to own that there is more in it than he dreamt of in his philosophy; the labourer participates in the general uprousing, and has visions of more regular work and increased pay; while the country gentleman talks about it, and yearns to try the experiment on a small scale on his own land. As the knowledge of what has hitherto been done in advancing this industry has only transpired through technical journals and chance paragraphs in the newspapers, I think that my readers may perchance feel an interest in being briefly told how it is that the beet-root has obtained so much importance, and how it is being utilised.

England is a great sugar consuming country, using three times the amount that even our sweet-toothed neighbours in France get

through; and in 1866, our consumption amounted to an average of 38 lbs. per head. Our colonies, too, particularly those of Australasia, require an enormous quantity of sugar, so that, adding English and colonial wants to those of the Continent, it may easily be imagined what a gigantic quantity of sugar has to be made to satisfy the wants of the civilised world; and what a serious thing it would be if these supplies were ever to fall short. And this is not a theoretical anticipation—it is already happening—for, in proportion as our demands are increasing, the yield from the sugar-producing colonial possessions of the various countries is falling off, partly from failure of crops, and partly from the scarcity of labour, owing to the disorganised state of society in many of the West Indian islands.

Whence then do all our supplies come? From our home possessions, and from the Continent, which sends us, we are told, 638,000 tons annually out of our total consumption of 2,320,000 tons. Mr. Gibbs, in a paper read before the Society of Arts in 1868, showed that in 1843 we derived nearly the whole of our supply from our home possessions, 4,000,000 cwts. being imported from the colonies, as contrasted with 70 cwt. from the Continent; but, by 1859, our consumption having regularly, but rapidly, risen to a total of 9,000,000 cwts., 5,500,000 of that supply were obtained from the colonies direct, and 3,500,000 from the Continent. It is true that some of this 3,500,000 might have been cane sugar, which was not wanted there, but a very large portion of it was made from beet-root, and the amount annually reaching us from this source has been regularly increasing, and is now upwards of 638,000 tons.

To whatever height the beet-root trade may reach in England, we are indebted to the Continent for it, and particularly to Margraff, a chemist of Berlin, who, more than a hundred years ago, demonstrated the feasibility of obtaining sugar from this source, and was the first to proclaim that beet sugar was identical with that of the sugar cane. Napoleon I. encouraged its growth, though adverse circumstances and stupid legislative enactments pretty nigh strangled it at the very beginning. The present Emperor of the French has, however, promoted the cultivation in every possible way, and from this and other causes, such as the peculiar adaptability of the soil and the special arrangements of farming property, it has spread over the whole Continent, until it has become a vast and profitable industry.

The original plant of production is the *beta maritima*, of which here are several varieties, such as the red beet and the Silesian

white beet (*beta cicula*), the one on which the trade is founded, as being the best sugar-yielder. The composition of the latter, as given by a recent writer in the *Chemical News*, is as follows:—Water, 83·4; sugar, with a trace of dextrine (about 0·1), 10·5; ligneous fibre, 0·8; albumen, casein, etc., 1·5; fatty matter, 0·1; organic substances, 3·7. The composition of sugar cane, on its part, is:—Water, 72·0; sugar, 17·8; cellulose, 9·8; saline matter, 0·4; so that, with the exception of the beet-root being a little more complex, there is not much difference between the two. The beet-root being a triennial plant, does not develope its root until the second year. I need not here go into the details of the planting and treatment of it while under the farmers' care, except to mention a few points which are of particular interest. The roots, which vary in size from 1 lb. to 3 lbs., are generally gathered early in November, before the frost can touch them; and on the Continent, are well covered over with earth, so as to protect them from the outer air, before being taken to the factory. In France, in the Tours district, a beet-root farm is cultivated on what is called a three-course shift, the first crop being wheat; the second, beet-root; and the third, clover. This is probably with a view to preventing the exhaustion of the soil to the extent that the beet-root crop is said to cause, by extracting the potash and other chemical constituents; and on this ground a strong objection has been made to the cultivation. However, a M. Kemmis, an engineer of Brussels, declares that the plan which he has adopted for the last six years, completely disposes of this objection, viz., the restoring to the land, after the crop has been drawn, of the residue left in the still, by a system of irrigation. The pulp of course goes to the cattle, and this residue gives back to the land the alkalies which the beet-root had withdrawn. According to him, the land has not only yielded crops of beet for six successive years under this treatment, but has become double its value. And, whilst we are on the score of objections, I will mention another that has been made to the growth of beet in England, viz., on account of our fickle and damp climate. There is no doubt that we can grow as big (or bigger) beet-roots than France or Belgium, and, if we were to regard them merely as stock feeding material, this would be all very well; but, unfortunately, the largest roots are at the same time the most watery and the least saccharine, so that the size is rather a disadvantage than otherwise. Mr. Howard, however, in a recent paper read before the Farmers' Club, altogether pooh-poohs this objection, and declares that the English climate is as good as that of any French or German beet-growing district, and that the average yield of sugar is quite equal to that

from foreign roots. The percentage on the Continent is estimated at 10 per cent., while some of the beet-root grown on the irrigation fields at Barking, was analysed by Professor Voelcker, and found to produce 13 per cent.

Let us now see how far the farmer is likely to be interested in the growth of the beet-root, as illustrated practically by the Suffolk experiment. In 1868, Mr. James Duncan, a merchant of Mincing Lane, determined to try if he could not establish some method of encouraging the English cultivation of the root, and of making sugar from it, and with great pluck and spirit erected a sugar factory at Lavenham, in Suffolk, at a considerable expense, hoping thereby to induce the farmers of the neighbourhood to grow the needful supplies. They showed very little hesitation at falling into his plans, and such success has attended the movement, that the whole district has felt the benefit. Formerly, the farmer grew but little beet-root, and what he did grow was for the purpose of feeding,—for conversion into beef,—the beet being worth 10*s.* per ton; mangold, however, at 7*s.* 6*d.* per ton profit, was the article commonly used for the cattle, the beet being a little more valuable on account of its high proportion of sugar. But now, the farmer takes his load of beet to the sugar factory, and there is paid 20*s.* per ton—a clear gain of one-half—and, in addition to that, instead of returning empty, he brings back a load of pulp or beet bread, the very essence of the feeding material, for which he pays 12*s.* a ton, thus obtaining a superior nourishment for his cattle. As the soil of Lavenham appears exceedingly well suited for the root, producing on an average 30 tons an acre, the farmers are naturally delighted with this steady outlet for their produce, and each year sees a fresh lot of beet-root grown. The experiment, too, is being tried with the same results in Lancashire, on the borders of Chatmoss, and in Berkshire, by Mr. Campbell, of Buscot Park, who has planted a large acreage with beet, and erected a distillery. An objection has been made to the beet-root factory system—that it must necessarily be idle for a good part of the year, being only able to be at work when the crop of roots is brought in; and that this enforced idleness entails the loss of interest on buildings and plant. In Germany, where the industry is carried on very extensively, this difficulty is got over by drying the roots in kilns, and thus preserving them for use all the year round. "In one large establishment in Gallicia," says Mr. Gibbs, "fourteen of these kilns, costing £500 or £600 each, have been erected within a circle of seven leagues round the central factory, the object of this distribution over so large an area being to reduce the cost of

cartage, which, upon a root containing fully eight-tenths of its weight of water, is very considerable. But such a plan, however feasible in Germany, where the country is open and devoted to large beet farms, would scarcely answer in England. Nor would it seem to be necessary, if the chemical process, which I will shortly describe, be sufficiently proved to come into general use.

Now let us see (keeping as clear as possible from technical terms) what happens to the beet-root, when it is brought to the factory. The usual plan of operation is to wash the roots well, so as to free them from clay and dirt, and then to place them within the clutches of circular saws, making over 1,000 revolutions a minute, by which they are torn to pieces and reduced to pulp. This latter is then packed in linen bags, and subjected to the action of an hydraulic press, by which the juice is all squeezed out, and the pulp becomes a cake. This not only forms the beet-bread,—so valuable for feeding purposes,—but, if not required for that end, can also be used for making brandy and vinegar; or, what is still more remarkable—paper, it being found by paper manufacturers to be superior to rag pulp. So that, whatever may be the defects in the beet process, incapability of utilisation is not one of them.

The juice which runs from the press is forced up by steam to what is called the defœcation pan, where, when a certain temperature is reached, milk of lime is added, and the juice consequently undergoes chemical changes; the albumenous substances being precipitated to the bottom, while the liquor runs off, tolerably clear, to the charcoal filters. It is not, however, pure sugar juice, but contains saccharate of lime, potash, soda, and other things, to remove which, it is exposed to the action of a current of carbonic acid and again filtered, when it comes out like pale sherry, and ought to be as clear. Finally it is evaporated in a vacuum pan, from which emerges a pasty material, composed of crystallised or crystallising sugar and molasses. By using the centrifugal machine, the latter runs off and leaves pure beet-root sugar, which has only to be refined to be fit for market.

What now, following out the system of utilisation, can be done with the molasses?—for unfortunately beet-root molasses are so exceedingly nasty, that it is difficult to apply them for human consumption, by the distillation of spirits, which nobody would drink. In Russia they are used with the fodder for the cattle, who at all events eat them greedily, if human beings do not. Some chemists propose to make oxalic acid from them, while others find here a valuable source of potash. And even as regards the spirits, a writer in the *Chemical News* points out, that they may be rendered pure by redistillation

with quicklime, and the use of freshly-ignited wood charcoal. As few of my readers are likely to be starting a sugar factory on a large scale, I need not go into the expenses of the manufacture, but will content myself with stating, that all practical beet growers and sugar producers unite in agreeing that a good percentage is to be had on the capital expended. At the same time, as the necessary buildings and plant are costly, I can see no reason why the factory system should not be adopted, as is now being done in Derbyshire and America for making cheese.

I think that I have said sufficient to show the importance of the beet-root cultivation to the country at large, and it only remains to mention the latest development of the manufacture of sugar, and its application on more general principles. A sugar beet-crushing and refining establishment at Lavenham or elsewhere is all very well, but it is a large concern to undertake, and requires a great deal of capital to start and work,—far more than most farmers could think of laying out; so that the consequence is, that very few districts would commence beet-growing, unless they had a factory within a reasonable distance. How then can the system be applied to agriculturists in general, so as to make it one of the standard industries of England? This difficult point has apparently been solved by M. Rousseau, who has for some years devoted himself, not only to the chemistry of the beet-sugar manufacture, but to its concentration, if I may use such a word, so as to make it as inexpensive and free from complication as possible. By his plan, the farmer will have to erect a beet-crushing apparatus capable of working 4,000 to 6,000 tons, at an expense of about £1,200. He may either supply it with his own crops or with those of his neighbours. The roots will be crushed and squeezed and made as usual into pulp, which he will take as material for feeding stock; but at this point comes the pith of M. Rousseau's invention. The juice or liquor will be mixed with lime, falling into it in small quantities out of a hopper, and the mass will be constantly stirred together until the sugar and lime form a combination, which he calls "sugarate of lime." When dried, it has the appearance of a brownish white powder, and contains in 100 parts, 70 of sugar, 20 of lime, and 10 of water. It is thus the concentrated sugar of the beet-root, which can be packed and forwarded to any part of the world without loss or risk, for, as it is unfermentable, it cannot become mouldy. The advantages to the farmer are obvious. With a not very expensive outlay he obtains productive beet crops, and still more profitable food for his cattle. As soon as his beet is crushed, he can sell his "sugarate" for ready money to any sugar manufac-

turer, who will only be too glad to get it. He saves the expensive haulage from his farm to the distant factory, while he provides work, both in winter and summer, for his labourers. The manufacturer and the consumer of sugar will both benefit, for, as from the cane juice at present only from 5 to 12 per cent. of sugar is obtained, from 15 to 18 per cent. will be realised by the "sugarate" process.

England is by no means the first or the most adventurous in this new and profitable field. On the Continent there are said to be 1,184 beet-root sugar works, while all the countries, and especially France, are largely increasing their beet farms. America is hard at work at it, although in Canada and many parts of the States they are less dependent on the supply of cane sugar than we are, for they have the sorghum and the maple, from which farmers make their own sugar, as regularly as they bake or brew their own beer. New South Wales, Tasmania, and New Zealand, are busy making experiments, and the Colonial Government have offered bonuses for good crops and their sweet results.

It always seems to me a great pity that, while foreign governments carefully watch and as carefully foster any new source of national industry and national wealth such as beet-root cultivation, our own pays little or no heed. Let it show itself capable of bringing in floods of riches to the country, or let it be languishing for want of timely support,—it is no matter,—official economy folds its hands, and trusts to people to find out for themselves, whether "it will pay." Self dependence and self assistance are very good things in their way, and have greatly contributed to the dogged pertinacity of the Englishman, who never knows when he is beaten; but I doubt whether the parent who takes no interest in what the son is doing is always the wisest one; and there are more signs than one rising up, which warn us that we shall be left behind in the race of nations, if our rulers persist in this do-nothing policy.

PHILLIPS BEVAN, F.R.G.S.

A CORRESPONDENT of the *Gardener's Chronicle* calls attention to a capital new potato, of a late variety, named "The American Red." The experience of the writer shows that, from 7 lbs., planted in the usual manner, and without any extra cultivation, he obtained 6½ pecks of splendid potatoes, some weighing 1¼ lb. each. They boil white and floury, keep well, and have shown no trace of disease. We would strongly recommend a trial by all cottage gardeners.

MANCHESTER PICKLES.

Pickles, although not a necessary article of diet, are yet so universally and extensively used, that their purity or adulteration becomes a matter worthy of careful consideration. In the following paper I purpose giving the results of the chemical examination, made in my laboratory, of a number of samples of pickles of different kinds.

When properly prepared, they ought to contain nothing but the vegetables themselves, with spices, vinegar, and a certain quantity of salt. The vinegar employed should be pure malt vinegar. This is a bright, clear liquid, with a brownish yellow colour and an agreeable acid and aromatic taste; its aroma being due to acetic and other ethers, and its acidity to acetic acid. The strongest vinegar contains 5 per cent. of real acetic acid, and has a specific gravity of 1·019. In many cases, however, we find that the vinegar employed for pickling has a large part of its acetic acid replaced by sulphuric acid, a material which cannot be habitually introduced into the stomach without interfering with health.

Malt vinegar is liable to undergo a putrefactive fermentation, and to prevent this the manufacturer is allowed by law to add sulphuric acid, to the extent of one part in the thousand by weight. But this amount seems very often, indeed generally, to be greatly exceeded in the vinegar in which vegetables are preserved, and this was the case with most of the samples which I have submitted to examination.

The results of my analyses are given in the following table:—

	Kind of Pickles.	Acetic Acid in 1,000 parts.	Acetic Acid (per cent.)	Sulphuric Acid in 1,000 parts.	Remarks.
1	Mixed	16·32	1·632	1·20	
2	,,	14·27	1·427	1·01	A trace of copper.
3	,,	25·00	2·500	0·47	
4	,,	20·91	2·091	2·11	
5	,,	10·29	1·029	3·26	
6	,,	19·10	1·910	2·00	
7	,,	None	None	5·13	A trace of arsenic.
8	,,	18·98	1·898	1·51	
9	,,	23·21	2·321	1·11	A trace of copper.
10	Girkins	28·37	2·837	None	
11	,,	29·00	2·900	0·68	A very considerable quantity of copper.
12	,,	22·01	2·201	1·03	
13	,,	8·63	0·863	4·21	
14	Onions	18·63	1·863	2.12	
15	,,	30·11	3·011	None	
16	,,	28·28	2·828	0·10	
17	,,	30·60	3·060	None	
18	Cauliflower	12·32	1·232	3·16	
19	,,	12·92	1·292	2·16	
20	,,	14·22	1·422	2·66	

This table contains the results of the chemical examination of twenty samples of pickles, all, I believe, purchased in Manchester; and all these, except three, show more or less sulphuric acid, whilst the quantity of acetic acid is very variable, there being none in one sample, whilst in another we have rather more than three per cent. The determination of the amount of sulphuric acid was in each case made by precipitating 100 grammes of the vinegar with baric chloride, and calculating the sulphuric acid from the baric sulphate obtained; but as this process throws down both the free and the combined sulphuric acid, and as a certain portion of the latter is always found even in the purest vinegar, it becomes necessary to discover as nearly as possible the average amount of this, and to deduct it from the gross quantity. From a series of experiments, it was concluded that 0·5 in the 1000 parts of vinegar would fairly represent this average, and that quantity has therefore been deducted from each result. No deduction has been made, however, for the one part per thousand which, as already mentioned, the maker is legally entitled to add to his vinegar. In three of the samples examined, viz., Nos. 10, 15 and 17, no free sulphuric acid was found; and in No. 16 there was only a very minute trace. These four samples may therefore be considered as, in this respect, perfectly pure; and they were not found to contain any other substance whatever of an injurious nature.

Nos. 2, 3, 9 and 12, contain practically not more than the quantity allowed by law, and therefore cannot be said to have been purposely mixed with sulphuric acid. In the other cases we may fairly assume that the sulphuric acid, or at least a considerable portion of it, has been added for the purpose of adulteration. And in one sample, No. 7, the whole of the acidity was due to sulphuric acid. In this sample I was unable to detect any trace of acetic acid.

Unfortunately, however, sulphuric acid is not the only, nor the most noxious adulteration, to which pickles are liable. We occasionally find copper and even arsenic, though seldom the latter. The occurrence of copper is much more rare than it used to be, for at one time it was almost impossible to obtain a sample of pickles free from this metal. When the subject was investigated by the Lancet Sanitary Commission in 1852, with the exception of four samples of red cabbage, which were not tested for copper, not a single specimen of pickles was obtained, which did not contain this metal. In the twenty samples which I have examined, copper in any quantity was found but in one, and in two others it was present in minute proportions only. In one of my samples, however, there was a small but unmistakable trace of arsenic. This was, no doubt,

derived from the sulphuric acid, of which this sample (No. 7) contained a large quantity, arsenic being an impurity that frequently exists in the sulphuric acid of commerce.

The amount of acetic acid in the different samples varies greatly, ranging, if we exclude No. 7, from 8·63 to 30·60 parts in the thousand; and we notice that it is generally in the samples containing the least acetic, that the greatest quantity of sulphuric acid is found.

From the above facts, I think we are justified in drawing the following conclusions:—

1st. That, at the present time, copper is occasionally met with in pickles; but that its occurrence, especially in large quantity, is comparatively rare.

2nd. That from the fact of copper, when found, generally being present in small quantity only, its presence may probably be attributed to accidental circumstances, such as the employment of the metal in the construction of some of the vessels used in the pickling.

3rd. That arsenic may sometimes, though very rarely, be found; but its presence being due to the sulphuric acid, which is employed as a substitute for vinegar, it is not likely ever to be met with in pickles which are prepared from pure malt vinegar.

4th. That sulphuric acid is very frequently employed as a substitute for part of the vinegar, and sometimes, though rarely, for the whole of it; and that we may expect to meet with this substance as an adulteration in 50 per cent. of all pickles.

5th. That the use of copper to adulterate pickles has now almost entirely ceased; but that sulphuric acid is used for this purpose to a considerable extent.

Sulphuric acid, in the quantity in which it exists in pickles, is probably not very injurious, though it can scarcely be taken habitually, without having some prejudicial effect. Even if it is equally wholesome with acetic acid, it is much less expensive; and, even putting health out of the question, we ought not, when we believe that we are buying pickles preserved in pure malt vinegar, to have a portion of this vinegar replaced by a substance of less value, and which we could buy at a less price; neither ought we to have a substance of this kind thrust upon us as a substitute for the more wholesome and more agreeable malt vinegar.

A. E. Davies, Ph.D.

PUBLIC HEALTH.

Part III.—VITAL STATISTICS.

Having briefly remarked upon the chief external conditions which affect the Public Health, and having indicated some of the great questions still in dispute,—questions which in their solution must materially affect the course of future sanitary effort,—I propose in the present chapter to say a few words on Vital Statistics, the numerical system by which it has been attempted to ascertain and tabulate, with something like mathematical precision, the increase, prosperity, collective health, and, inferentially, the life conditions of our rural and town populations.

It will probably appear strange, in papers devoted to the public health, that vital statistics should be dwelt upon to the exclusion of anything like statistics of health; but the writer has no option—health statistics, or registers of disease, do not exist except as the result of local effort in parts of the metropolis and some of our provincial towns.* Our knowledge of the health of the people of England, collectively or in sections, must be gleaned from many, and often, very unlikely sources. Much ingenuity has been expended in the search, and sanitarians have perforce pressed into the service reports and tables which have been compiled with very different ends in view. For the present I shall confine my remarks to three of these:—The Census; The Register of Births, Deaths, and Marriages; and the Register of the Cause of Death.

Census.—The first census for Great Britain was held in the year 1801, (the first for Ireland was in 1811,) and an enumeration of the people has been made decennially ever since. Another, the eighth, is close at hand; on an early day in April, 1871, when all reasonable Englishmen are supposed to be at home, during the lull between Christmas festivities at friendly houses, and the general summer exodus to the Continent or the sea-side, the Registrar General will despatch his waggons from Somerset House, laden with 50 tons of paper† (the householders schedules), which an army of 3,600 enumerators will distribute, without delay, through every corner of the land. On one particular day they will be collected, and the result will appear in those valuable tables from which we obtain the number of houses with their rateable value—the population living on

* *Vide* Dr. Morgan's Reports of Manchester and Salford Association; Dr. Whitmore's, for Charitable Institutions in Marylebone; Dr. A. Hill's, for Birmingham; Dr. Philipson's, for Newcastle and Gateshead; etc.

† Evidence before the Royal Sanitary Commission, 1869.

limited areas, or in public institutions—their age, sex, and social conditions—whether married, unmarried, or widowed—their occupations, and the county or country in which they were born;—facts which have an important bearing on the duration of life, and which cannot be neglected in any estimate derived from other sources of the health, and health-conditions of a community. From the census alone, independently of other sources of information, little can be learned of the public health,—that is, of the collective well-being, as far as health is concerned, of masses of the people,—but much may be gathered as to the conditions under which they live, their material prosperity, or the reverse, and the front they will offer to the inroads of disease and death. This may be shown in many ways.

Sex.—Taking sex, for instance, any marked excess of the male or female elements of a population will inevitably affect the prevailing character of disease amongst them, where such disparity exists, and the rate of mortality also; for it is found that in England, on an average, 23·33 males die annually out of every 1,000 living, whereas of females 21·51 only would die in the same time, out of an equal number of living.

Age.—Much the same may be said of age, which will affect the mortality to a far greater degree; for, whilst male children under five years of age die at the rate of 72·42 annually in every 1,000 living, and females during the same period of life at the rate of 62·46 in the same number, (a mortality which meets with no parallel at any age up to 65,) between the ages of 10 and 15 so small is the liability to death, that, speaking generally, 5 only in the 1,000 succumb and fall victims to the destructive influences within and around them.* It will make a material difference, therefore, whether a town is well stocked, for educational and other purposes, with young people at the healthiest ages, or whether, as is the case in some of the rural districts, the young migrate to the towns in search of employment, leaving the crippled, the sickly, and the extremes of childhood and old age, with their enormous rates of mortality, to swell the village death-roll and stock the parish churchyard with those instances of longevity which, to the present day, are held to be evidence of the health of the locality in which they are found.

Marriage.—Even the civil condition may exert an influence on the death-rate, if we are to credit the deductions of the Registrar General for Scotland, that *benedicts* have the advantage of bachelors in the chances of survival and length of life.

Density of Population.—From what has been previously said (p. 37.) on over-crowding and its attendant evils, it will readily be

* Thirtieth Annual Report, Registrar General, p. 21.

seen what inferences may be drawn from the figures giving the number of houses on limited areas, with their rateable value and the numbers that live in them.

Occupation.—We need not adduce more to prove the influence of occupation, beyond the fact that, "at the age of 35 to 45 the mortality of London tailors is 57 per cent. higher, and the mortality of London printers more than 117 per cent. higher than that of the male agricultural population of England."*

Migration of Population.—Lastly, the movements of the people, as shown by the entry of place of birth, will supply the clue to many a riddle in the statistics of mortality and disease. From these we learn of that great human stream which is setting from the country to the larger towns, where youthful health and vigour are ever being defaced by over work and unhealthy surroundings, with their almost inevitable results, depravity and disease.

The census then, although it tells nothing directly of health, is invaluable as a means of correcting first impressions derived from other sources, such as the statistics of mortality, which we shall presently have to consider. It will often enable the close observer to put his finger at once on the actual cause of an increasing death-rate, and discover a means of averting it.

But the census is decennial, and much may happen in the space of ten years; it takes but five decades (52 years) for our population to double itself in England. In ten years a fishing village may spring up into a town—a quiet bay become a fashionable watering place. The increase may not be the natural growth by excess of births over deaths, but due to other causes, acting spasmodically, and unforeseen. The further, therefore, we get from a census, the less reliance can we place on the figures denoting the *estimated population*, that is, the population at the preceding census, with the addition for each year that has since elapsed of the annual increase, as ascertained from an average of the preceding decade of years. It may be Utopian to hope for a more frequent enumeration of the people; but Prussia, with her triennial census, and France, with her quinquennial returns, should stimulate our exertions in this direction. Simple enumeration, omitting the more complicated particulars of the regular decennial census, could not be either difficult or expensive; and there can be no doubt that, even in this modified form, it would be of material service to the Legislature, and, incidentally, to the cause of public health.

Before passing on to the second head of my subject, I must express a hope that the minute information obtained at a census, respecting

* Sixth Report, Medical Officer of Privy Council.

the population of limited areas, such as streets and blocks of houses (each enumerator takes about 200), in our towns, will not be allowed, as it has hitherto been, to pass beyond the reach of those who could utilise it on the spot, and to be consigned, after satisfying the requirements of the State, to the waste paper receptacles of Somerset House. Dr. Gairdner has shown, in Edinburgh, how essential these minute sub-divisions of the population may prove to the health officer, in his investigations concerning the spread and origin of epidemics or special forms of disease. In selected streets of the New Town he found a mortality not exceeding 16 or 18 in 1,000 living, while in certain closes of the Old Town the death-rate amounted to 33 in 1,000. In the best quarters the death-rate of children under 5 years was less than 50 in 1,000 living; in the worst of those examined it was apparently no less than 173 in 1,000.

Registration of Births, Deaths, and Marriages.—The close relationship which the census bears to the registration of births, deaths, and marriages, will be apparent from the quotation I have just cited from Dr. Gairdner's valuable work on "Public Health in relation to Air and Water." They are as the right hand and the left of sanitary statistics, and no reliable deductions could be drawn in the absence of either. Previous to the year 1838, when the first report of the Registrar General appeared, the wildest views were held as to the sanitary state of towns. Liverpool is an instance in point, its great increase in 1831 having been attributed to the salubrity of its air![*]

Burial returns and parish registers of births had yielded the most reliable life tables then existing, such as the Northampton tables of Dr. Price, and those derived from the mortality at Carlisle, by Dr. Milne; whilst the ages on the gravestones were for the general public a rough and ready test of the health conditions and the welfare of the people.

The general application of statistics to the public health formed a new epoch in the sanitary history of England; certainty thenceforth took the place of conjecture, and many dark spots in our centres of industry were at once detected and exposed by the impartial evidence of the Registrar General's arithmetic. Dr. Farr was also enabled, by a judicious use of the same figures, to construct those magnificent life tables for England, which have added so much to our knowledge of the value of life at various ages, and supply one of the best tests we as yet possess of a people's health.

E. T. Wilson, M.B.

[*] Mr. Rickman, in "Population Abstracts," 1831.

POPULAR FOOD ANALYSIS.

No. 3.—COFFEE.

(CONTINUED FROM LAST MONTH.)

HAVING seen in our last number the properties of coffee, let us now take a glance at those of its chief adulterant. Chicory, as employed for this purpose, is the dried and roasted root of the common endive, so dear to the lovers of winter salads, as a substitute for lettuce. This plant is to be seen growing wild in many of our hedgerows, and belongs to the botanical order of *Compositæ* It is very similar to the common dandelion, which belongs to the same order, but it is readily distinguished by the colour of its flower, which is blue, while that of the dandelion is yellow. The chicory root also bears a great resemblance to that of the latter plant, being, like it, soft, and exuding when squeezed the milky juice so well known to all of us who have enjoyed, as children, the pleasure of wandering in the fields.

Our wild English plant is not, however, so much esteemed in the market as the German and French varieties, which are specially cultivated for mixing with coffee. The following analysis will show the composition of chicory root in its dried state, and also that of its ash, to which we shall have occasion to refer hereafter.

I.—*Dried Chicory.*

Moisture	17·480
Gum	20·416
Sugar	11·166
Extractive (bitter)	18·000
Fat	1·066
Woody fibre, &c.	29·202
Mineral matter	2·670
	100·000

II.—*Composition of the Ash.*

Potash	0·672
Soda	0·408
Lime	0·250
Magnesia	0·184
Iron	0·085
Sulphuric Acid	0·284
Chlorine	0·127
Carbonic Acid	0·078
Phosphoric Acid	0·303
Sand	0·279
	2·670

From these results it is evident that this plant contains no principles which would render it to any extent a useful substitute for coffee, as we look in vain for the *caffeic acid*, or the *theine*,

already shown to exist in the latter article. But what shall we say if, besides containing nothing valuable, it should be proved to be positively injurious when freely consumed? Let us hear Dr. Johnston on this subject.—"Taken in moderate quantities, the ingredients of chicory are probably not injurious to health, but, by prolonged and frequent use, they produce heartburn, cramp in the stomach, loss of appetite, acidity in the mouth, constipation with intermittent diarrhœa, weakness of the limbs, tremblings, sleeplessness, a drunken cloudiness of the senses, etc. At the best, therefore, chicory is a substitute for coffee to which only those to whom the price is an object ought to have recourse." To these remarks we would add, that we prefer not being poisoned even at the most moderate cost; and in cases "where price is an object," we would advise the public to abstain from paying anything at all for such a filthy beverage, as chicory-coffee undoubtedly is, to persons of unvitiated taste. We might bring up many other charges against this nasty infusion, but we will only give one more, and that is a dictum of Dr. Boer's, to the effect that the continual use of chicory causes *amaurosis*, and consequently blindness. Since giving our coffee results last month, we have been seriously remonstrated with by a grocer, who declares that he and his brother tradesmen put nothing else into their coffee but chicory. This is, however, only a repetition of the old story, told long ago by Dr. Pereira, who said that, "while the grocers, on the one hand, cheat their customers by adulterating coffee with chicory, the chicory dealers in turn cheat the grocers by adulterating chicory." Whether the grocers are, or are not, the chief sophisticators, is comparatively immaterial, for the fact remains that the public continue to suffer. The grocers cannot, however, be held innocent, as they buy *ground chicory*, which article *they can purchase at a cheaper rate than they could the dried root itself;* and of what then do they, in their innocence, imagine it to be composed? Out of twenty samples of ground chicory purchased lately in London (but of the analyses of which we have not space at present to give details) more than half were found to be adulterated.

We now turn to the detection of the adulterations of coffee. Many simple processes have been from time to time proposed, to ascertain whether this article be pure or not, without saying exactly what is the adulterant; and of these we subjoin a few.

1.—Take the packet of coffee as it comes from the grocer's, in your hand; and, having given it a good squeeze, lay it gently on the table, and open it. If the contents be found adhering together in a cake, the sample is not pure.

2.—Drop gently a teaspoonful of coffee on the surface of a glass of water, and observe if any of it sinks immediately; if so, it is bad. Let the whole be now slightly stirred, and notice the colour imparted to the water; if this be a decided brown tint, then the coffee is adulterated, most probably with chicory or burnt grain of some kind.

3.—Make an infusion of the coffee in the usual way, pour some into a cup, and let it stand till cold; if a skin or scum should form on the surface, there is reason to suspect baked animal matter, such as horses' liver.

If, however, we seek methods of discovering the precise adulterants employed, by means of chemistry, the subject becomes at once much more difficult, and the results not always reliable. One method is to treat 25 grains of the sample with an ounce of ether, in a closed bottle, for an hour, with frequent agitation; and then, having poured off the solution so obtained into a weighed watch glass, to evaporate to dryness, ascertain the weight of the residue. The undermentioned matters, treated in this way, gave the following results:—

Coffee (plantation Ceylon)	3·75 grains.
Chicory (best English)	1·50 ,,
Roasted Grain	·90 ,,

Several years ago (in 1852), when public attention was much directed to this subject, Messrs. Graham and Stenhouse published a report, "On the mode of detecting vegetable substances mixed with coffee." They found that the most striking points of difference between chicory and coffee consisted in the much greater quantities of grape sugar and sand, which existed in the former, than in the latter. A reference to the various analyses in the present article, and that of last month, will easily show these distinctions. But it unfortunately happens that an equally great proportion of sugar exists in most succulent roots, such as dandelion, beet, and parsnips; and that, in wheat and most kinds of grain, the silica is as large, as in chicory. Taking these points into consideration, we cannot, therefore, place any great reliance on chemistry for the detection of such adulterations as form the subject of our present considerations. On hearing this, many of our readers will doubtless exclaim: "Well, if chemistry cannot help you, how did you make the investigations reported last month?" We answer, by means of the microscope; and we will now endeavour to show how this instrument is used, and how any person possessing one may easily examine coffee.

The credit of first seriously calling attention to the use of the microscope as a detector of adulterations, belongs decidedly to Dr.

Hassall, whose food examinations created so much sensation about fifteen years ago; and it is now imperatively necessary that every analyst who turns his attention to food should be not only a good chemist, but also a practised microscopist. In treating this branch of our subject, we will divide it into distinct heads for more easy reference.

1. Mode of Employment.—The microscope is to be placed upon a steady table, so that the *source of light* shall be *on the left of the observer*, and the "body" of the instrument is to be placed in a slightly inclined position. The operator, looking into the instrument, is then to move the mirror about, with its reflecting surface turned to the light, until a perfect illumination of the microscope is produced.

2. Source of Light.—The best light is that reflected from a white cloud on a bright day, direct sunlight being always avoided; but, if the day be dull, good lamplight is much to be preferred to bad daylight. The best source of artificial light is that of a good moderator or paraffin lamp, which should be so arranged in height as to bring the flame about half way between the stage and the mirror, and about a foot away from the instrument. The upper part of the chimney of the lamp should be fitted with a reading-shade, to throw the light down on the mirror, but prevent its being diffused about the room, exactly like the lights over a billiard table.

3. Mounting the Object.—For this purpose the operator should be provided with some slips of good patent plate glass, 3 in. long by 1 in. wide; also with a box of thin glass covers, cut either in squares or circles, though the former are the cheaper and do quite as well. He should likewise get some stout needles and fit them into small pieces of wood to act as handles, leaving only about ¼ in. of the point end of the needle sticking out. When about to examine the object, he should place a slip of glass on a piece of white paper, and put a few grains of the coffee (taken from the sample on the point of a penknife) near one end of the slip. This portion of coffee is now to be moistened with a drop of water, and allowed to soak for some time. The operator then takes a pair of needles, and, by means of them, thoroughly tears all the grains to pieces, so thin as to be almost transparent. A few of these fragments are then to be drawn to the centre of the slide, moistened with a drop of water, and a thin glass cover to be adroitly dropped over them, taking care, by letting one end of the cover down first, to expel all air bubbles. The object is now ready for use; but, until one has had some experience, the complete avoidance of air bells

is very difficult, and it is therefore advisable for the operator to make himself familiar with their appearance, under the various powers of the microscope. The same hint applies to pieces of hair, which are apt to fly about, and through which, along with air bubbles, most ludicrous mistakes have been made by inexperienced persons.

4. Examination of the Object.—The slip, with the object mounted, is to be placed on the stage of the microscope (which has been previously fitted with the ½-in. power and "C" eye piece), and the body of the instrument is to be brought down to within a little more than half an inch from the object. The operator now looks into the instrument, and gently turns the body farther down till the object appears. The focussing is then to be completed by the fine adjustment, and the whole object minutely examined by moving it about gently in various directions. It is always advisable to acquire the habit of keeping *both eyes open* when looking into the instrument; and this ability to, as it were, concentrate all your thoughts on one eye, is much more easily learned than would be imagined, and is a great saving to the sight, which is apt to be impaired by much labour at the microscope.

5. Microscopic Appearances of Pure Coffee.—All our preparations being now complete, we look at a sample of pure coffee, and find it presents an appearance similar to that shown in Fig. 1. We notice that there are two totally distinct forms visible. (1). Several little flat fragments marked all over with irregular angular cells. These are fragments of the body, or substance of the seed; and the cells are those which contained the essential oil, already referred to last month. (2). A number of peculiar oval, or rather lance-shaped bodies, resting on a fibrous membrane, and having tooth-like oblique markings between their edges. These are fragments of the outer skin or *testa* of the seed, and are wonderfully characteristic of pure coffee. None of those structures appear in any of the usual adulterations of this substance.

6. Microscopic Characters of Pure Chicory.—Having changed our slide, and substituted pure chicory for pure coffee, we at once see a vast alteration. Here are no lance-shaped bodies, nor angular cells; but, instead, we have the appearances shown in Fig. 3. We now notice a mass of round and elongated cells, evidently of a soft tissue, which form the principal portions of the substance of the chicory root. We also observe a number of long tubes laid in bundles over the cells, having a most characteristically and beautifully marked surface. These tubes come from the centre of the root, and, once seen, can never be mistaken, except for the similar tubes of dandelion, which we will next describe.

7. MICROSCOPIC CHARACTERS OF DANDELION.—These are shown in Fig. 4, and are so similar to chicory as to be readily mistakeable for that root. On examining them more minutely, however, with a ¼ in. power, a difference is observable. The cells are more elongated, and the tubes are more decidedly marked in complete rings, while here and there we find masses of a structure closely resembling the ribs of an animal.

In Fig. 2. we show the appearance of adulterated coffee, in which the reader will recognise all of the structures above mentioned. For the detection of roasted grain, we depend mainly on the appearance of granules of starch, which can be identified by their size and shape. The cells of turnip are much larger than those of chicory, while particles of sawdust, especially mahogany, can be picked out from coffee, by means of a needle, and readily identified. Mineral colouring matters may be discovered by burning some coffee in a small porcelain crucible, when, if the ash be red, it is certain that venetian red, or other ferruginous earth, has been added to deepen the colour.

As in this world partisans can be found for almost any dogma, no matter how ridiculous it may be, provided that it is only asserted loudly and unblushingly enough,—so our grocer friends have, by dint of continual asseveration, got a large number of people to positively believe in chicory-coffee, and call this filthy root an improvement! The terrible absurdity of this idea must be manifest to any one who glances for a moment at the subject. Chicory is a root, while coffee is a seed. The former, buried in the ground, deprived of the influence of sunlight or air, only contains a few of the crudest vegetable matters, so to speak; while the latter, flourishing under a tropical sun, has all those complicated and refined organic principles, such as alkaloids, for the formation of which the action of light, etc., appears to be absolutely necessary. The advocates of chicory adulteration know well that it produces a sensation of oppression in the stomach, and they take advantage of this to pretend that chicory-coffee has strength, and are believed by ignorant persons who cannot discriminate between that quality and indigestion, and whose palates have long since been thoroughly vitiated. Another cry of these apologists for adulteration is, that, thanks to chicory, coffee is brought down within the means of the poor, who otherwise could not afford to drink it. This is very like bringing down champagne for the use of the poor, by adding three-fourths of small beer, only that in this case two good things would be spoiled, whereas chicory is too nasty to spoil at all. The simple fact is that, as a rule, the poor get little or no coffee in their

shilling mixture, while the grocers get that sum per lb. for a substance which would not fetch 6*d.* per lb., if it were sold in its own name. But we live in a country of "vested interests," and, as the grocers have a "vested interest" in this adulteration, it is temporised with, and was for a time actually legalised, under a trifling restriction which was seldom even complied with.

In conclusion, we have simply to ask that the public should somewhat bestir themselves, and apply the spur to our tardy legislators, so that it shall be made a misdemeanour to sell, under any circumstances, a mixture of chicory and coffee. This would not hurt any of the chicory epicures, as they could still buy their succulent mouthful in a separate form, while it would protect the great mass of the community from a daily-perpetrated fraud. Our authorities every now and then make a spasmodic dash at something, and lately their hobby has been "tea dust" and "re-dried leaves;" but after all, even with the terrible addition of the frolicsome Chinese pigs, about which we have heard so much during the last few weeks, the sale of such commodities is no worse than the daily winked-at traffic in chicory-coffee.

In a future article we shall treat of the essence of coffee (first introduced by Mr. Daniel Dunn), and compare the qualities of the various so-called preparations at present in the market, from analyses now in progress.

J. MUTER, Ph.D.

SOLID BEER.

THE age produces some queer paradoxes, and none more so than in the results of manufacturing science. In former days it was the custom to buy bread, and even beef, by the yard; but we believe that it is only in the present day that we can get our beer by the pound. By a very simple process, introduced by Mr. Mertens, the wort, after being made in the mash-tub of malt and hops in the usual manner, is sucked up by a pipe into a large vacuum (exhausted by an air-pump), and then persistently worked round and round, while the moisture is evaporated. The wort emerges from its tribulations with a pasty consistence, and is allowed to fall from a considerable height into air-tight boxes, in which it reposes, like hard-bake. It soon gets so exceedingly tough, that it has to be broken up with a chisel and mallet, and, in that condition, is easily sent abroad, or to any part of the world, for people to brew their own malt liquor. We have had the wort subjected to analysis, the results of which, in 100 parts, show that there is almost absolute purity:—Gum, 64·219; sugar, 20·664; lupulin (the active principle of hops), 2·000; albumenous matter, 0·600; mineral matter, 1·500; moisture, 11·017.

Those west of Temple Bar group themselves naturally into several classes, though some combine the distinctive characteristics of each; thus, there is one class which offers a choice of viands at so much per dish or plate, *à la carte;* a second proffers dinner, *à prix fixé*, from the joint, with etceteras and cheese for a stated sum; others leave the customer free to select which arrangement of these two he may prefer; others, again, "dine early," or draw a distinction in price between the early and late diners. It is impossible, in the limits of this article, to do more than offer our personal experiences of a few taken almost at random, yet with some regard to their presenting quasi-typical examples, and their being selected from those where a visitor can dine at an hour when the day's work is over; and we would, in old-world fashion, pray the gentle reader to remember that the results placed at his disposal have not been lightly gained, for dining with observation is somewhat of an "*improbus labor.*" Criticism and digestion are apt to disagree; but the interests of the multitude of vagrant diners call for the protection of the "Food Journal," and in the discharge of duty, perils of dubious napery, suspicious meats, and unsatisfactory cookery, have been cheerfully encountered. The results may help to guide the numbers who have to seek their daily dinner, and those, moreover, who have to study economy. The chance visitor does not care, if he devote a few extra shillings to his dinner in London; but we write for the hundreds, who do not like to exceed a modest limit of expenditure, and who, finding a place where they may consult their tastes and pocket, resort regularly thereto, and deserve to have their claims to be enfranchised on a dining qualification, considered in the next Reform Bill;—for them we have endured, and for them we write, sufficiently rewarded if they say, that the "Food Journal" was a friend indeed.

To begin then with that place where the Press states "the roast beef of old England can be washed down with the vintage of Burgundy."

Carr's, hard by the entrance to Wych Street, offers a dinner from the joint, with vegetables and cheese, at 1*s.* 6*d.*; and our experience enables us to say that Carr's keeps its word. The situation attracts a numerous class of legal clients, and lawyers generally like to be well fed. The quality of the meats is of a fair average; but it must be noted, however, that the attendance is scarcely sufficient, if the rooms are tolerably filled. It seems a false economy to annoy hungry and impatient guests with needless waiting. Diners like to be passive in that particular; any defect in this respect, however, arises in no degree from *want* of attention on the part of the waiters or the civil manager.

There is one point on which we would offer a suggestion, which applies equally to all: Why should the diner, who likes to commence with soup, be condemned to a large soup-plate full? At private tables, a small supply suffices to prepare for the solids to follow. In all public dining-rooms a quantity is served, apparently calculated according to the amount of turtle coveted by a gobbler at a Lord Mayor's feast. The host who would undertake to supply a plate of soup of ordinary private life, at half the rate charged for the huge jorum usually propounded, would deserve a parsley crown, *ob cives bene servatos;* and what is more, it would pay him better. The vegetables and cheese at Carr's are other points to which we would invite the attention of the proprietor. In London, only two varieties of English cheese are apparently known, and named respectively, Cheshire and Stilton. The Cheshire has too often a Yankee twang, or else reminds one who has lived in cheese-producing countries, of "export cheese;" but the rich, red lands of Cheshire are guiltless of its production; and why are the other excellent varieties of Cheddar, Wiltshire, etc., denied a place in the *carte?*

To return. The smoking-room at Carr's needs a word of censure in passing; but, on the whole, the numerous *habitués* of this well-known house will affirm the verdict, that a man may dine well and comfortably here for 2*s.* 6*d.*; and, if he chooses, drink a pint of fair light Burgundy for an additional shilling: the sensible custom of charging attendance still prevails here. We may save some from a like disappointment to that which it was our lot to encounter, by stating that Carr's is not open on Sunday. On that occasion we took refuge in the Somerset, and were well treated, but beyond the general impression, which is favourable, have not preserved materials for criticism.

Simpson's is too well known to need much notice, and, indeed, often too much crowded for comfort; the range of price is higher; but the unvarying excellent quality of the meat, and the nicety of the service, reconcile the dining visitor. The charge is 2*s.* 3*d.*, which, with the 3*d.* charged for attendance, fixes 2*s.* 6*d.* as the price for joints, etc., without any soup, fish, or liquids. Yet, at Simpson's, we remember to have been served very recently with the very smallest whiting which, except when fishing off Brighton or Scarborough, we ever saw. Here, too, the patience of the guests is sometimes tried; there is a want of accommodation for hats and coats, which might, we think, be remedied; and some more effectual measures for ventilation should be adopted to dissipate the culinary vapours, which at present render respiration an auxiliary mode of taking in essence of dinner.

We must record our experience of a *table d'hôte* dinner at the Windsor Restaurant, in the Strand, near Agar Street. The day was Sunday, the hour five; curiosity prompted us to "greatly daring, dine." The dinner consisted of tolerable soup, a sort of ragout of veal, roast beef, pudding, and cheese. About fourteen rather polyglot guests sat down. The dinner was very fair, abundant in quantity, and surprising for the price. The civil landlord presided; and—including a pint of our loved bitter, and, emphatically, *the* waiter, who tried to be like Sir Boyle Roche's bird, and failed—the disbursement was 2*s*.

In another parallel of latitude, namely, Oxford Street, at the corner of Tottenham Court Road, we discovered a dining-room, called the "Horseshoe." Behind, foam the vats and smoke the chimnies of Meux's brewery. We must highly commend this unpretending hostelry. The guest can here choose his dishes *à la carte*, or dine *à prix fixé*, from the different combinations of soup, fish, and joint; in either case the charge is very moderate. We made an excellent dinner off a good cut of salmon—an extravagance in February—and roast beef, with vegetables and cheese, and the whole cost was 2*s*. 9*d*. The service of the table and the attendance were excellent, and the quality of the provisions good; a stranger in that vicinity would not regret it, should he drop in at the Horseshoe. We will now recall some disappointments, and in doing so, we will "nothing extenuate nor set down aught in malice." Some months ago a letter in the *Times* highly commended a little restaurant in Church Street, Soho. Soups for 6*d*., and *vin ordinaire* at the same low figure for a half bottle; a *carte* presenting varieties of plates of appetising quality, all combined to swell the before unknown merits of Kettner, and the eulogy sent numbers of guests thither. We too went, and found that popularity has its disadvantages, at least for the would-be diner. The happy finder of such a place would do well to reserve the knowledge for himself, and a few intimates. We should advise the intending visitor to get a small party together, take possession of one of the private rooms, and depute the most knowing of the set to select and order dinner. Our experience was this:—The *carte* was very promising, and the arrangements good; but the room was very small—a dozen made a crowd; the good will of the energetic mistress as she appeared to be, was inexhaustible, but she could not attend to every one; the cookery was good, but the delays were exhausting. Dining seemed rather to become a prolonged dream, as when a starving man sleeps, and sees in fancy an unattainable feast, from which he wakes unsatisfied; while another fact helped to

strengthen this feeling of illusion—each plate was so very, very small. We shall not easily forget the ludicrous dismay of a stalwart Indian civilian, who had selected a *cotelette de porc*. After much loss of time and temper, it came—such a shred of a cutlet; the absurdity of it actually made even the victim laugh. About an hour and three-quarters were expended in procuring a dinner, which cost several shillings, and was only a preliminary whet for supper. With this delusion we mentally couple our experiences of the Globe and the Solferino Restaurants, in Coventry Street and Rupert Street. At the Globe, we did not dine, but consumed and paid 2*s.* 6*d.* for oyster soup, of unpleasant colour and watery taste, and *bœuf à la mode*. There are two woes!—"To suffer and to tell." In size and quality that *bœuf* resembled only those convenient but coarse pieces of meat which the legendary Frenchman fed upon in London.

Those *cartes* of many pages, like small, but illegible bilingual pamphlets, offer a perplexing variety of dishes; but no ingenuity, and we should think no acquired experience, can combine a dinner which shall satisfy, and cost less than 3*s.* 6*d.* The quality of the meat is decidedly inferior, while the quantities make one realise the state of a crew on short allowance. *Chacun à son goût*, we confess to preferring good meat, though the cookery be not pretentious, and the choice extend not to a bewildering number of species. We may remark *en passant* that, for the execrable character of the meat, we give the palm to a grand restaurant in Oxford Street, where we were served with some so-called roast beef, at the recollection of which our soul shudders, and we "struggle to forget the anguish and the pain." The quantity of a dish of potatoes, where charged as a separate item, has been always a puzzle, each potato apparently costing ½*d.* and often 1*d.* The London-French estimate of their value is curiously high, judging from the prices affixed to *pommes de terres*, as well as other vegetables, compared with the quantity served up.

What a relief it was to us, to forget our woes in the quiet rooms at "Bibra's," in St. Martin's Lane; it is a pleasure to be able honestly to commend, though we selfishly fear to bring a crowd to our favourite haunt. The system adopted is a price per dish, and a man of simple tastes can easily please himself, and dine well and most comfortably for 2*s.* to 2*s.* 6*d.* The quality and quantity of the meats are alike deserving of praise; and the lover of curry will thank us for telling him where he may find it, though we write not for Anglo-Indians, who are never satisfied on that head. Yet we may aver, that the Bibra curry exactly resembles the product of a recipe imparted to us by a skilful Indian artiste.

We give, as a good specimen of a bill of fare, extracts from one carried off by us, doubtless to the surprise of the proprietor:—Soups—gravy and julienne, 6*d.*; ox-tail, 9*d.*; soles (fried), 8*d.*; sole fillet *à la maître d'hotel*, 9*d.*; roast beef, 8*d.*; roast mutton, 8*d.*; lamb and mint sauce, 1*s.*; rump steak pudding, or stewed neck of lamb and peas, 1*s.* 3*d.*; curried fowl, 1*s.* 9*d.*; entrées, 1*s.* to 1*s.* 6*d.*; lemon pudding, 4*d.*; rhubarb tart, 4*d.* The Globe charges 4*d.* for mashed potatoes, half the quantity supplied here for 2*d.*; and 8*d.* for cauliflower charged here 3*d.*—a suggestive contrast.

The Civil Service seems to recognise the merits of the modest house opposite Aldridge's, and the same faces may be seen night after night. A smoking and billiard-room complete the arrangements, though, we confess, we have sighed for an unprocurable glass of whisky toddy, for no spirits are sold; but the malt liquors and wines are equal in quality to the solids. Sunday, be it remembered, is a *dies non* here. We may contrast the general character of this house with that of a much-frequented concern in the Strand—Upton's Dining Rooms. These cannot be said to be defective, either as regards the quantity or the quality of the viands. They do not provoke censure, but they do not deserve over-much praise; they are substantial, and of good average class; there is an inattention to the nicer points of service; the table-cloths are not so white as they might be; the dishes, etc., have a veteran aspect, and the cookery is of the old-fashioned English, *i.e.*, coarse; one eats, but does not dine, and the same amount of money, expended at the last-named dining rooms, will purchase a better dinner than Upton's can furnish. The comparison is an instructive one: Why should our dining-rooms of the present day not cultivate the graces a little more? The profits would hardly be lessened; but it is the old fashion, we suppose. We dare not hint at a difference of classes, or talk of "Philistinism;" but, surely, even for the lonely meal of the nomad diner, we may have a little more care in service, in cleanliness, neatness of table material; and a little more comfort in those uncomfortable, angular, pew-like boxes. Upton's opens its hospitable doors on Sunday till three o'clock, and then the hard-worked and obliging employés obtain a well-earned period of rest.

We would close our brief jottings here. The examples selected will be found to be rather typical, and many more remain to be commented on. If the august editor will assent, we will, next month, to fresh fields and pastures new.

W.

PLATTER *versus* TANKARD.

With a lofty pretension of intellectuality, some people make a boast of an indifference as to what they eat, and aim at conveying the impression that they are above any such material employment, as the selection from a *menu* implies. It is a great mistake to suppose that the system, even in such elevated beings, is equally indifferent to the nature of the food supplied to it, for food has to be digested and, further, assimilated. Without digestion, speaking broadly, there is no assimilation; and beyond this negative disadvantage there is the positive one, namely, that, without digestion, or in the degree that digestion is interfered with, under the influence of the warmth and moisture of the stomach, certain unwholesome and even putrefactive changes take place in the food, which practically poison the system. Therefore it may be said, that dining is the most important act of a man's life, especially of the life of the intellectual and initiative man. The food of the mere hand labourer is scarcely less a matter of consideration, since the amount of work he can perform is, *cæteris paribus*, mathematically in proportion to the quality and quantity of his food. "No song, no supper" may be, under certain convivial circumstances, an expedient arrangement; but "no supper, no song" is the real physiological postulate. The smallest twinkle of the eye involves an expenditure of substance, which must be compensated by food, no less definitely than the larger—shall we say waste? incurred in making the ascent of Mont Blanc.

Food, to fulfil its requirements, must excite the palate—or, at any rate, gratify it—and stimulate appetite; for on these conditions the due secretion of saliva in a great measure depends. Now, saliva is almost as necessary for digestion, as boiling water is for making tea. Saliva is mixed with the food by mastication, and possesses peculiar qualities, one of the most striking of which is the remarkable power of inducing metamorphosis of food matter,—for example, of changing starch into sugar.

Not only in a physiological, but in a moral point of view, it may be shown that the quality of the food has an important bearing. There is the instinctive desire to stimulate the palate, which cannot be ignored; to whatever degree asceticism may be carried by individuals, the mass will certainly obey the dictates of instinct.

In the highlands of Scotland, oatmeal—as porridge, or imperfectly baked—is, with the agricultural labourer, the bulk of his food, not forgetting a fair allowance of milk; fiery whisky is the complementary element. In Ireland, potato being the representative of oatmeal, whisky is again a popular want. In both these divisions of the kingdom the rankest of dried fish and the blackest of short pipes are luxuries, perhaps more esteemed in Ireland than in Scotland. Let us compare the diet of the Asiatic Indian: rice and dhall are the equivalents of the oatmeal and potato, but rank butter *(ghee)* and spice take the place of the whisky; while the short black pipe is replaced by the high flavoured hubble-bubble. The Indian temperature places within reach of all, palate stimulants, which are so fatally represented by alcohol in colder countries. Thus, in two opposite races, widely separated in every way, the same essential dietetic phenomenon is presented; that is, a large proportion of the meal is, if not absolutely tasteless, at least insipid, while a palate stimulant of the most decided character is used, as a complementary element of the food.

We may even call in pathology to support our position. Ulceration of the stomach is commonly caused by the use of ardent spirits. Ulceration of the stomach is more frequent in the northern latitudes of Europe, where also the habitual use of ardent spirits is most prevalent; the staple articles of food are there of the least appetising quality.

The philosophical consideration of this question is just now one of great political importance. How to make the people sober, or how to check intemperance, is a momentous problem. Drink is shown, by unassailable statistics, to be the very constant handmaid of crime. Conceding, for the sake of argument, that drunkenness is the cause of crime, we would say, in respect of a remedy, Educate! Educate!! Educate!!! For we would have it borne in mind that, in Mohammedan countries, where the use of alcoholic fluids is, by the national religion, interdicted, crime is not unknown; and we assert, that any restriction on the sale of alcoholics, as a legislative enactment of the paternal stamp, carries within itself a *reductio ad absurdum*, since the persons living nearest to the places for the sale of alcohol, according to the restrictive view, will become entitled to compensation by the State, on account of exposure to extra risk; for, unless towns be built or rebuilt in circles, with the public-houses in the centre of the circle (a point, we are taught, equally distant from every part of the circumference), some houses must necessarily be nearer the source of temptation than others; and thus the people who live in them will be more exposed to harm. Tens of thousands

of men and women in Great Britain live in average good health without the use of alcoholic stimulants; it is, therefore, a clumsy and illogical method, we would say it emphatically, of dealing with the question, to determine, by a board of magistrates, the *necessity* or the contrary of a public-house in a particular neighbourhood.

Our proposal, then, is not only to educate in the three R's, but to make a part of education consist in the teaching the nature of food materials and the art of their preparation. Our proposition is that, by the diffusion of such directly useful knowledge, we should promote temperance more surely, than by interfering with the autonomy of the Subject, by dictating where, when, and how he may buy his liquor.

Intemperance, besides its associateship with crime, which is extremely suspicious,—though, in truth, the source of crime lies probably deeper than the bottom of the ale tankard,—is the actual cause of a great proportion of the poverty and attendant miseries that weigh down the people. Can we substitute for palate stimulants which intoxicate, palate stimulants which are harmless?—for the palate must be gratified. Such a substitution is doubtless possible, but it can be only practicable by wide diffusion of a knowledge of cookery. If we find the educated class quite innocent of any knowledge of the effect of boiling water on a potato, for example, (and we will undertake to say that not one person in a hundred can explain off-hand in what consists the cooking of a potato), how are we to expect from uneducated women a supply of cooks, or that the wife of a labouring man can set before her husband, from simple materials, a tempting dish? To make tempting dishes from simple elements is a feat, not only quite possible, but easy. "How do you mix your colours, Sir?" said a rather stupid person to a great artist. "With brains, Sir," replied the artist. Just so with food. The same raw material can be so manipulated, as to produce either appetite or nausea. The value of a knowledge of the rudiments of cookery, may be illustrated by the following fact:—During the Russian War, five or six young medical men entered the Turkish Service, and proceeded to Eupatoria; they were mostly recommended to the Turkish Government on account of their having distinguished themselves as students. On landing, they were directed to their quarters,—empty rooms; were duly supplied with rations, uncooked rice and fowls, and left to shift for themselves. With these raw materials they would simply have starved, had not one of their number, who had habitually kept his mind open to every kind of useful knowledge, general as well as special, possessed an acquaintance with cookery; and, with the aid of some

charcoal as fuel, been enabled to feed his famishing colleagues, with a stew not by any means to be despised under happier circumstances. The proposition we wish to establish is, that a knowledge of the nature of food substances, and of the mode of preparing such substances, so as to minister to an instinctive want, is an indispensable step towards rendering a people sober, and thereby affording a chance for the growth of a higher moral life. Habitual topers may be spasmodically amiable, æsthetical, and religious, but the aïd afforded to human progress by such is, we fear, small. Intemperance actively impedes human progress. Sobriety, however, is not all in all, for one can easily imagine perfect temperance to co-exist with the grossest selfishness. Educate, so that people shall almost necessarily choose a rational temperance, and thus, for the real work before them, be as fit as Providence has pleased to make them.

T. W. N.

We are relieved to learn that the great "mud butter" question is a *canard*, invented by certain imaginative persons, for the purpose of making a "sensation" paragraph. Dr. Muter has analysed the mud, and some grease extracted from it, and came to the conclusion that, although the latter contained a good deal of fatty matter, the proportion of grease existing in the mud could never have made the speculation profitable. On this point, therefore, our suspicions are lulled, but only to be roused in a different direction. A provision dealer at Sheffield, named Charles Fielding, has been summoned for selling 350 lbs. of putrid butter, which he at once admitted was a regular article of trade, and sold largely to "fancy bread" confectioners, who paid 9*d*. per lb. for it. The butter was Canadian, and the importance of the trade may be imagined, when he stated that he sometimes had 17,000 lbs. of this delectable compound on his premises. For this system of wrong doing, Mr. Fielding was fined 20*s*., the extreme penalty of the bye-law. Is it not time to get these bye-laws altered?

From a pamphlet, written by Mr. Draper, it appears that the counties of Londonderry, Antrim, and Tyrone, have been lately getting drunk in a more scientific way than by the old-fashioned use of alcohol. Methylated ether is the special "vanity" which commends itself to the thirsty souls, the quantity taken at one time being two to four drachms, and the dose being repeated twice, thrice, and even six times a day.

COLUMBIA FISH MARKET.

The neighbourhood of London Bridge was in old times the locality which, on a principle of "natural selection," the good citizens of famous London town would choose for a market to get their fish. It was sold about Queenhithe and Billingsgate in such a haphazard style, that the origin of the latter as a market cannot be determined. In the reign of Henry III., Queenhithe was the chief landing place for fish, and as the dues of this place were the perquisites of the Queen Consort, the court party naturally favoured this site; but fish-dealers then, as now, had their own views of fish supply, and established themselves as best they could in this locality, in spite of royal prerogative. Hence the names of Old Fish Street, Fish Street Hill, etc. At first the vendors had mere boards for their accommodation, and afterwards stalls, which developed into sheds, and these again into shops. In the fifteenth century, fish was sold at an uncovered market a little to the north-west of London Bridge, and at Stocks' Market, the site of the present Mansion House, the "stock" fishmonger dealing only in dried and salted fish. For two or three centuries the supply of fish, like everything else in those days of monopolising guilds and corporations, was mainly in the hands of privileged persons; and hawkers, the progenitors of our modern costermongers, were regarded as little better than smugglers. It was not till 1699 that Billingsgate was made a free market by Act of Parliament. For a century and a half Billingsgate was almost wholly supplied by water carriage, such driblets as came by vans, from Gravesend for example, being mere exceptions. The arrivals and the hours of business were regulated—or disarranged, if you will—by adverse or favourable winds. Railways caused the market to "suffer a sea change," and now, soon after 3 a.m., ponderous railway vans begin to arrive, and continue till 10, or even 11. The approaches to the market being as inconvenient as possible, the natural consequence is that Lower Thames Street is completely blocked up all the forenoon, resulting in continuous conflicts between police and carmen, and in the use of language which is *not* drawn from that "well of English undefyled," from whence Spenser tells us Chaucer drew his utterances, but which smacks of a market which has a proverbial reputation in this respect. The recent

Traffic Act enacted that no van should stop longer than 15 minutes to unload, and that, if the operation was not then completed, it was to be driven away round Tower Hill, there to wait its turn for a second attempt. Pompous police and demonstrative carmen do not agree on such matters, and hence summonses, fines, and general dissatisfaction; hence also fruitless efforts to obtain a mitigation of the rigour with which the Act was enforced.

This continued confusion and uproar in the fishy precincts partly gave rise to the proposal of another fish market; but meanwhile the Traffic Act had worked towards the establishment of a general market. Armed with this enactment, the late Sir R. Mayne issued a ukase, which struck terror to the costermongers of the metropolis. The poor coster had to "move on with his barrow" with a vengeance, and all sorts of heavy restrictions were imposed upon him in the pursuit of his calling. Great hardship and distress resulted, and to relieve this, and give to costermongers something of a status, Miss Burdett Coutts, who "hath a tear for pity, and a hand open as day for melting charity," generously came forward, and caused Columbia Market to be built at her sole expense. The site is a short distance from the Shoreditch Terminus of the Great Eastern Railway. This noble and really elegant market, which was inaugurated by the Archbishop of Canterbury, in April, 1869, covers 16,000 square feet, and cost no less than £150,000—truly a splendid monument of benevolence. On the north there is a handsome market house, the Gothic architecture and lofty clock-tower of which form a marked contrast to the makeshift buildings that characterise London markets generally; on the east and west are arcades and rows of shops; and on the south there are market offices and two covered areas for stalls. As Columbia Market arose out of the distress of the costermongers, and the munificence of Miss Burdett Coutts, it is scarcely surprising that, when the rigour of police Dogberryism was relaxed, and costermongers even obtained privileges which they had not previously possessed, the market should fail. The truth is, that the great mass of the poor do not like regularly established markets, and even your economical housekeeper, who is not absolutely poor, fights shy of them. In proof of this, the result of inquiries lately instituted by the Markets Committee of the Corporation of London may be instanced. The subject of inquiry was, whether daily meat, vegetable, and fish markets should be established in the City. The inquiry, we must presume, was fairly carried out, though whether with a foregone conclusion we will not speculate. Be this as it may, the Committee found that at one time or other there were several retail markets in the Metropolis, including St. James's, St.

George's (Southwark), Carnaby, Hungerford, Randall's (Poplar), Fitzroy, Finsbury, and the People's Market (Whitechapel); that all of these have ceased to exist; that efforts to establish markets in South London, in Leicester Square (and we may add Sloane Square to these), had fallen through; that Columbia Market had not answered the benevolent intentions of its foundress, and that King's Cross Market had also proved unsuccessful;—and from all this the Committee concluded that the poorer classes do not, as a rule, resort to the regularly established and covered markets, but prefer purchasing at the street stalls, and of the itinerant vendors, and, therefore, that additional markets were not desirable. These facts cannot be disputed, but how far they are affected by heavy market tolls and vexatious restrictions, we will not now inquire. Suffice it to say, that Columbia Market proved a failure.

But out of failure has grown success. It had long been generally admitted that London wanted another fish market, (and, parenthetically, it may be mentioned that the Common Council are being urged to establish yet another, on unappropriated ground in Smithfield,) and Miss Coutts at once generously acceded to the suggestion, that the experiment should be tried at Columbia Market. Accordingly, in February last, it was opened as a wholesale and retail fish market. Three-fourths of the then well-nigh deserted area were covered with glass and iron, the roof being supported on light metal columns; so that it is scarcely too much to say that its original character is lost, and we may exclaim, "Flesh, flesh, how art thou fishified!" There are still a few shops that have nothing whatever to do with fish, and there are vegetable stalls, etc., but the word Columbia will henceforth be as suggestive of fish as is Billingsgate; and the former, "not to put too fine a point on it," need fear no comparison with the latter. The grand entrance from Crabtree Row is 40 feet wide. Uncovered alleys communicate with the eastern and western arcades, and with the market house and offices. Under the lofty roof are ranged the stalls of the fish dealers. There are at present 110 stalls, twenty of which are set apart for wholesale dealers, the remainder being appropriated to "bomarees" and retailers. The bomaree purchases of the wholesale dealer, and sells, by auction or bargain, to the retailers; and this arrangement, which is of old standing, is found to work well for the three classes. The wholesale dealers appropriately occupy the central avenue, the stands of the bomarees having the next advantageous position, while those of the retailers occupy not so prominent, but a not less commodious situation. It is intended that the number of stalls shall be increased to 132. During the present year, Miss Coutts gives this standing room

and the necessary advantages free of all charge, but from the commencement of 1871 a fair rent will be charged. By the bye-laws it is provided that the market is to be opened from the 25th of March to the 29th of September at 4 a.m., and from the 29th of September to the 25th of March at 5 a.m. There is a large vault, well ventilated and lighted, below the market, which will ere long be appropriated to the shell-fish trade, and a boiling-house for this department has been already erected. In due time the three classes of the trade—wet, dry, and shell—will be amply accommodated, and every facility will be afforded for the large trade that will undoubtedly be developed. The munificent lady, who is veritably the good angel of the entire district, will shortly obtain Parliamentary powers to lay down a tramway from the Great Eastern terminus to Columbia Market, and then there will be nothing to prevent an immense fish trade being carried on here for the advantage of the entire metropolis, and the special benefit of the locality. Already the beneficial influence of the market has been felt in the poor and crowded district which it adorns. Making due allowance for the unfavourable weather that has prevailed since the market was opened, there has been a plentiful daily supply of fish; and the poor, after the excitement of the early sales is over, have been enabled to get fish food at prices almost unknown before—splendid cod, for example, at 3*d.* a pound.

Everything is in favour of the development of Columbia Market. The Great Eastern and the forthcoming tramway will facilitate the arrival of large supplies from the eastern coast, and by the same railway, and by the North London, the Metropolitan, and the London, Chatham, and Dover lines, fish can be readily despatched to all parts of London. The market itself is thoroughly adapted to its uses; its approaches are good; it is light, well ventilated, well kept, and plentifully supplied with water; it is also to be established on sound commercial principles, though it originated in unostentatious charity; while it should in justice be added, that the control of such a gentleman as Mr. Sapsford, who, at the request of Miss Coutts, undertakes the management, is an unquestionable advantage. A market tavern has been wisely recognised as inevitable, and it is commodiously situated; while a reading and writing room has been regarded as advisable, where the visitor may read "the best possible instructors" for a halfpenny, and also have writing materials; or he may indulge in the luxury of a "wash and brush up" for a penny. In fact, nothing that kindly thoughtfulness could suggest has been overlooked in Columbia Market.

J. M. Philp.

GERMAN BEER.

MILLIONS of gallons of beer are annually produced and consumed in Germany, and especially in the south of that country. The Imperial Exchequer of Austria derives an average income of seventeen million florins from this most productive article of taxation; and, in this respect, it exceeds all other Continental nations. Vienna beer has not long been known in England, and its importation may be dated from the year of the great Paris Exhibition, on which occasion the dark, amber-coloured beverage, with white, frothy head, was much appreciated by visitors. It has obtained a firm footing in Paris, to judge from the annually increasing quantity consumed in that capital within the last three years. A question arises whether such a beverage could not be produced in this country; or in other words, what is the difference between English and German beer?

From the very earliest times, beer has kept its place in the households of civilised nations. Millions look upon it as liquid food, and, whether right or wrong, science holds that beer contains nutritive substances. Whenever sugar is subjected to a certain treatment, it is transformed into alcohol and carbonic acid. The latter is a well known gas, exemplified in champagne and soda water, to which it imparts their refreshing taste and effervescence. Whenever starch undergoes a certain treatment, it is transformed into sugar, and it is used on account of the easy convertibility of this substance into alcohol.

The process by which starch is converted into sugar, and sugar again into alcohol and carbonic acid, is called fermentation, and hence the term "fermented liquors." The usual admixture of hops or pine cones with the wort gives a peculiar and distinguishing flavour to the beer. Simple as these principles may appear, the art of brewing is not easily acquired, for we have to deal with troublesome and fickle material; and, without care and knowledge, it is as difficult for an inexperienced person to brew beer, as it is to navigate a ship. Instead of sugar, a wort not unlike sour milk may be the result; and instead of beer, vinegar, or even worse substances, the odoriferous properties of which would rouse the neighbourhood in self defence. In describing the German mode of brewing, we will confine ourselves to the ways and means adopted in the larger

establishments, the treatment of materials being in all cases the same for the small barrel for home consumption, as for the oceans of beer supplied to the trade.

First, the barley has to be converted into malt. To this end, it is allowed to germinate up to a certain point, after which its growth is suddenly checked by the application of heat. For this process the spring and autumn are considered the most favourable seasons, on account of their medium temperature. To induce germination, the barley is steeped in troughs made of wood or stone, where the grain is covered with water, on the surface of which the lighter and decayed seeds float, and are skimmed off, whilst the sound grain subsides. The steeping is continued until the grain becomes uniformly soft, a period occupying from forty to forty-eight hours, or still longer in the case of old barley. It is then drained and placed in heaps from 6 in. to 10 in. in height, which are enlarged after twenty-four hours. In these heaps the grain becomes warm, swells, and ultimately begins to sprout. The white protuberances form into little roots (radicles) in from ten to twenty days, after which the heaps are evenly spread to the height of 2 in. or 3 in. over the floor of a darkened apartment; and this process, called sweating, is one of those precarious stages in the development of the material, in which an experienced hand is most needed. The heaps have to be turned over, so as to keep the temperature between 55° and 62°, and to insure the development as much as possible of all the radicles alike. As soon as the radicle, or the "acrospire," as the maltster calls it, has shot to the length of about one and a half that of the grain (at which period it bifurcates), and just as the plumula, or leaf shoot, is about to make its appearance, the vitality of the seed is extinguished by rapidly drying the grain on perforated metallic plates,—first, by means of a current of air, and next by the application of artificial heat. This must not exceed 140°, otherwise the starch would be injuriously acted upon, and much of the diastase would lose its efficacy. The value of the malt mainly depends upon the amount of diastase which the germinating process produces in the grains; for this diastase is the fermenting action that causes the starch to change into sugar; indeed, it is capable of changing not only the starch contained in the malt, but also an extra amount, that may be added unmalted, a practice that tends materially to lessen the expense of brewing. The colour of the malt affects the colour of the beer, genuine dark beers being produced from malt that has been subjected to a scorching temperature; and in this particular point we might take a lesson from German brewers, who, on

the whole, work more economically than we do in England. They scorch unmalted barley if they want a colouring matter, and for the very good reason that diastase, which, as we have shown, is a valuable ingredient, cannot bear exposure to a high temperature, without its efficacy as a ferment being destroyed. In this fact lies the advantage of scorching unmalted grain which contains, as yet, no diastase liable to destruction.

The next process, called "mashing," assigns to this substance its peculiar field of operation. The ground malt is digested with water, and the starch contained in the mash is converted either into sugar, or into another substance called "dextrine," into which all starch is turned before it becomes sugar. Dextrine is a kind of gum, and we are inclined to believe, that it plays an important part in the manufacture of German beer. It is this substance, or one closely allied to it, viz., metamorphosed gluten, which imparts body, flavour, and softness to this beverage. Dextrine, called by the French "leiogomme," is an article specially prepared for the use of calico printers, who employ it in mixing their colours, in order to give them the requisite consistence. We have now arrived at a stage when the difference in the modes of brewing becomes more apparent. Hitherto, in the treatment of the barley, little deviation will be noticed from our own practice. The principle of mashing, however, is almost entirely different from ours throughout the Continent, and to this, for one thing, we must ascribe the distinctive characteristics of German and of English beer. At Burton-on-Trent, a place peculiarly favourable for brewing purposes, on account of its spring waters, the following mode is in vogue:— The barley, after being slightly crushed between revolving iron cylinders, is conveyed to the hoppers or receivers, which are placed over the mash tubs. After the water for mashing is let into them, the charged hoppers are opened, and the malt is gradually dropped into the water, and mixed with it by hand or by machinery. This kind of mashing is known by the name of "infusion." The other, employed throughout Germany, is designated the "decoction method," and its principles are briefly these: The ground malt is mixed with lukewarm water, and the temperature of the mash raised by boiling a portion of it, and adding it to the rest. The evident effect of this treatment is, first, the destruction of the fermenting power of the diastase in the portion which is boiled; and secondly, a less vigorous action of the starch in the mash tub, so that less sugar and more dextrine are generated. The result of this is obvious: dextrine resists fermentation where sugar does not, and moreover it does not turn sour. Hence it is most

probable that this dextrine is retained unchanged, and ultimately held in solution by the beer.

An old custom seems to be based upon this fact. In days of yore, the duty of examining the beer devolved upon the magistrates and authorities, who applied a test according to the best of their knowledge. The liquid was poured out on boards upon which it was allowed to dry, and if it stuck, it was pronounced to be good. From that time, more than 200 years ago, to this day, the respective governments have never ceased to extend their parental care and surveillance over the manufacture of the national beverage; and the law still regulates the action of the breweries. In Bavaria, for instance, the brewers are required to use 6 *Eimer* of water (about 12 gallons each), in the summer, and 7 *Eimer* in the winter, per *Scheffel* (about 6 bushels) of malt.

The control thus exercised, and rigidly adhered to, has established in the minds of Continental people a certain confidence in the wholesomeness of their daily beverage. Fifty years ago the British public were roused by revelations made regarding the brewing of beer, to which most of the subsequent enquiries must be referred. When Mr. Child explained that the taste, flavour, and appearance of beer were produced by the use of pernicious and disagreeable ingredients, some people were fairly startled, and justly so. A Mr. Morris, among others, issued a recipe, the readers of which could scarcely be blamed for denouncing beer as poison. Here is the exact wording of the document;—

"To make up a vat of 150 barrels, use half a barrel of colouring, a quarter of a hundred weight of cream of tartar, a quarter of a hundred weight of ground alum, one pound of salt of steel, and two barrels of strong fining. Mix these well together, and put them in a vat, rousing it thoroughly at the same time. Let the vat remain open three days, then close it and sand it over. In a fortnight it will be fit for use; your own good sense will inform you how to advantage."

The bitter beer, for particulars of which we must refer our readers to the *Times* and other papers, during March and April, 1852, was re-established in public confidence, by the Burton brewers throwing open their establishments to the inspection of competent men, thus showing clearly that no drugs are needed where good malt, hops, and pure spring water are to be found.

Upon the amount of sugar in the wort, depends the quantity of alcohol which the beer will contain. German beer, in consequence of its greater amount of dextrine and its less amount of sugar, yields

less alcohol. The percentage, small in all cases, is from 4 to 4½ in Bavarian beer, from 6 to 7 in porter, and from 6 to 9 in ale. Bavaria, producing on an average 120 million gallons per annum, may be regarded as a fair type of a German beer-brewing community.

In the treatment of the sweet wort, there is another difference to be noticed, which is of no little importance. It is the extent to which hops are used, and the manner in which they are prepared. English hops are artificially dried, with the addition of a small quantity of sulphur; while Bavarian hops are left on the poles to dry in the sun. It is probable that the fickleness of this climate would prevent the adoption of the foreign method. The quantity of hops added to the sweet wort is far less on the Continent than it is in this country; for, on account of their narcotic properties, the strongly hopped beers are believed to cause headaches (*Katzenjammer*). The following list shows the amount used in some breweries:—

At	For every 100 lbs. of	Hops per lb.
Munich	Winter Beer	2·3
,,	Summer Beer	4
Bamberg	Winter Beer	4·4
,,	Summer Beer	8
Kulmbach	Winter Beer	4
,,	Summer Beer	12
Karlsruhe	Winter Beer	2·9
,,	Summer Beer	7
Bohemia	Winter Beer	2·2
,,	Summer Beer	3·3
Prague	Winter Beer	4·4
England	Porter	about 12
,,	India Pale Ale	32
Scotland	Ale	12

The hops are added to the wort, and both are boiled together in open coppers. By this means the wort is concentrated; the essential oil and tannin of the hops are extracted; the albumen, which would prove injurious to the preservation of beer, coagulates; and traces of starch are precipitated. A clear wort is thus obtained, after straining, what is here called, the "hop-back." Thence the wort passes into the coolers. These are large wooden cisterns from 6 in. to 8 in. deep, generally placed so as to be under the influence of a sharp mountain breeze—and where this is not obtainable, a system of pipes, through which flows a current of cold water, is arranged in the cistern. Ventilators are resorted to in smaller breweries, while the manufacturing housewife, who has neither apparatus at command, stirs the liquid with a ladle, or whatever her ingenuity can devise. Rapid cooling is essential,

for the wort is inclined to ferment; and, although fermentation is presently desired, it is of a different kind. In Belgium, however, where the wort is left to itself, a peculiar sour beer is produced, and sold under the title of "Faro" and "Lambik," which, to our ideas, requires a taste, the acquisition of which we can hardly envy.

The cooled wort contains sugar, and out of this sugar, or rather out of the greater part of it, we have to make alcohol. We must here refrain from going into particulars concerning the action of yeast, the question being at present so undecided. In the recent January number of the *Annalen der Chemie und Pharmacie*, Liebig has commenced a refutation of Pasteur's and Lermer's theories, and some time must elapse before the problem can be solved. Suffice it to say, that, when kept at a temperature of about 68° for a few hours, the liquid becomes turbid, and small bubbles rise to the surface. The amount of yeast added is 6 to 10 pro mille in volume. The process of fermentation lasts from 7 to 8 days in the case of winter beer, and from 9 to 10 days in the case of summer beer. There are two modifications of yeast; and here we arrive at another difference in the modes of brewing. The kind used in England is called surface yeast (*oberhefe*). It brings about a more rapid action than the sediment yeast (*unterhefe*) used in Bavaria, which produces a slow fermentation at a low temperature. The latter condition most probably prevents its being employed with advantage in this country. It is said that the formation of carbonic acid, and its remaining close to the surface of the liquid, prevent the otherwise noxious influence of atmospheric air. At a stated time, and according to the judgment of the brewer, the fermentation is checked by the application of cold in the form of ice or otherwise. The sugar is not all converted into alcohol, for this would also check the evolution of carbonic acid, by which the head of the beer would be lost, and its taste become stale. There is a resinous aroma in the German beer imported into England, which is probably attributable to the pitch used in calking the barrels, but which is believed to contribute to the preservation of the beer.

Warmth or shaking will bring about a recommencement of the fermentation, or rather, a stronger evolution of the carbonic acid which gradually accumulates in the barrel, as a kind of after action. This should be prevented; and hence the use and value of cool cellars, for the beer ought not to be in its last stage of fermentation, until it is poured out for drinking purposes.

E. H. Fournier.

THE FOOD CUSTOMS OF WEST AFRICA.

West Africa has not so much that is peculiar in its diet, as might be anticipated from its character as a land of wonders. The staple is the same there as in most other warm climates—viz., beef, goat, mutton, wheat, maize, millet, and yams. Still, there are a number of special articles which do not occur elsewhere, and much that is incidentally interesting, particularly in the districts which are least known. Old Calabar, until within the last fifteen years or so, was one of the little known regions; and that it is otherwise now, is due to the United Presbyterian Mission, which established various stations in that country. Fortunately for science and the outer world, this mission has been represented by able and liberal-minded men, who did not consider that their duties required them to shut their eyes to anything that might be of worldly interest or benefit to their fellow men. The names of Waddell, Goldie, Robb, Thomson, Wylie, Hewan, Timson, and Sutherland, are well known as contributors to our knowledge of Old Calabar. It would be out of place here to record their benefactions to science, although few can say so much of them from personal acquaintance as myself; but, as the information embodied in the following paper has been mainly supplied to me by Mr. W. C. Thomson, it is only fair that I should express my obligations to him. Perhaps, too, as the communication made to me by Mr. Thomson is the fruit of his own observation, for which his long residence in Africa, of more than twenty years, spent in the services of the Christian Mission and the United Presbyterian Mission Societies, particularly qualified him, it may be right that I should give *verbatim* the following account of the foods and food customs of Calabar, in answer to my various questions on the subject:—

"My first five years in Old Calabar were spent at Creek Town, of which old King Eyo, otherwise and deservedly called the Great King Eyo, was then the chief. In those days, though not now, every chief of any consideration had what was called his chop-day, or feast-day, when he entertained at a banquet all his friends of nearly equal age with himself, their position in respect to wealth being a matter of subordinate consideration. King Eyo had two such days, on one of which he entertained his European friends, the

supercargoes and missionaries; and, on the other, feasted his native gentry. The former, as well as the latter, occurred every eighth day, being omitted only when it happened to fall on our Sabbath. I was often a guest at his table on whiteman's chop-day.

"When the time came round, a discharge of three heavy guns (half buried in the sand at his wharf), at exactly ten a.m., announced the fact to all the world, and reminded supercargoes in their ships five miles off, at Duke Town, of their duty to be ready to come to chop betimes. A special messenger was also sent down to them with a polite little note, to be exhibited to each, inviting them to the repast, though more, perhaps, for the purpose of ascertaining who were coming and who were not, and the reasons for refusal. About a quarter of an hour before seats were taken, another messenger was sent up to the Mission House, to invite the resident missionary or missionaries to come down, all being ready.

"Full dress was very varied and easy among the whites, each one coming in the rig that pleased him best, both in respect to comfort and convenience. There were white birds, black, and magpies, the first decidedly predominating; some with jackets, others with easy coats, and some with neither—exactly in the costume one sees in the cricket-field. In cold weather, during the "smokes" (the period of the Harmatan elsewhere), King Eyo would don a morning-gown, or a great white flannel shirt reaching well down to his ankles, though he generally appeared in native full dress; *i.e.*, with a few strings of costly beads round his neck, two yards of cotton cloth about his loins, tied in a great bow just about the right hip, and a silk handkerchief bound pretty firmly round his middle.

"The table was an excellent piece of British furniture, capable of seating comfortably fourteen or twenty persons. It was overlaid with a table-cloth of the usual texture, white, clean, and perhaps even ironed, though I cannot venture to be positive on that point. Plates (uniform), ivory-handled knives, plated forks and spoons, with cut glass tumblers, were arrayed after our own style, for the use of guests. The most striking objects on the table, however, before the viands began to appear, were a pair of immense decanters, about 2 ft. high, containing the *mimbo*, a species of palm wine in general use in Calabar. The liquor was of the very best, the early produce of the plant, the richest of the sap quite recently tapped, and just at that early stage of fermentation, when a pleasant slight degree of pungency is imparted to it. At times it had a pale purple colour, and was then esteemed the finest. At other times it was pale pink, and sometimes opalescent. The poorest was from the latest yield of the plant, had less body, and looked very much like milk and

water; but at King Eyo's table it was always fresh, sweet, and palatable. In former days, other decanters were to be seen on the table, containing port, sherry and brandy, for the use of his white friends, he himself having become a total abstainer from all intoxicating drinks from youth. But these latter the king found it expedient to banish from the board, his guests having too much of the festive manners of the gods of Olympus, to make it comfortable or safe to offer them.

"Several young men and boys, sons of chiefs, and his own slaves, attended as waiters, the dishes being brought by young women from the various wives on whom it had devolved to prepare them. It was their duty to carry them to the head of the stair, where the young men received them, and passed them to table.

"About four o'clock p.m., King Eyo took his seat at the head of the board, the guests following to their places in no particular order. The seat on the King's right was accorded to the senior missionary present, whose duty it was to say grace; that at the foot of the table was sometimes occupied by Tom Eyo, the King's eldest half-brother, a fat, good-looking, good-natured, and polite man, who was proud of his manners, and still more of his good English. King Cameroon was also a pretty constant guest, occupying a seat on Tom's left. He was a very little man, with a huge head, and anything but good looking, standing only four feet some inches high, and possessing a scar on his face, which was often referred to by King Eyo, in testimony of the necessity for keeping his port, sherry, and brandy out of sight. Another character often present was Otu Honesty, remarkable for the greatness of his imbibing powers, and the long draughts of mimbo in which he delighted. Tom's usual dress was a morning gown; King Cameroon wore a white shirt, and a silk handkerchief tied round his middle; while Otu clothed himself in a garment of the like sort, but of small blue-striped cotton.

"All being seated, a lad went the round of the guests, bearing a brass pan with water, and a clean towel over his arm. The native gentry always washed before meat, and most of the whites did so too. Then the courses began, each consisting of one native dish, from which, however, everything obnoxious to European prejudices was excluded; but, as I cannot recollect the precise order in which they appeared at King Eyo's command, I must conjure them up in the best way that I can remember.

"1. *Afia-abia* consisted of plain boiled yam, served up in masses, in a large shallow calabash, placed in the centre of the table, the persons sitting nearest it helping all comers. It was accompanied

by a stew, sometimes of fine fresh fish, sometimes of a portion of the fatted goat always sacrificed for the occasion. This stew—a dish in general favour—was served up in the native earthenware pot in which it had been cooked, and was set on the table before King Eyo, on a stout wickerwork ring, which served as a stand for it.

"2. *Ewuk-abia;* by which is understood Calabar chop, served up in a large calabash, the masses of yam being arranged in it in as tasteful a manner as possible, with the sauce poured over them, and fish and flesh set here and there as an upper stratum. This dish was a special favourite with white men.

"3. *Usung*, or *Foofoo*, the most characteristic native dish of all. Here also the sauce was produced at table in the pot in which it had been prepared, and was set before King Eyo to be served by him. It was called black soup, from the circumstance of its being deeply coloured with a black powder, prepared by charring the capsule of a four-winged legume, and reducing it to a pulverulent state. This sauce, or soup, contained but little animal matter beyond powdered shrimps and dried fish, and less of the latter than other similar dishes required. The foofoo or beat-yam, of firm, tough consistence, came to table in the same wide, flat kind of calabash, in two huge rudely spherical masses, of the size of a seventy-two pound cannon ball, the calabash being set in the centre of the table. White guests, as a rule, required fresh knives and forks in discussing this dish; but one or two would occasionally undertake the business *à la mode*, and, like King Eyo and his black friends, dispense with all superfluous adjuncts, and betake themselves to the instruments of nature's own providing. The idea of using knife and fork to foofoo is perfectly ridiculous to the Calabar man; indeed, if one may judge by the grimaces and shrugging of the shoulders, with which he refers to such ignorance and inaptitude, it would even appear to be very disgusting. However, at King Eyo's table, the barbarous fashion of using knife, fork, and teeth to foofoo was far from uncommon; and even old Tom himself had become accustomed to it, and able to dine quite heartily in spite of the prevailing degeneracy, as he doubtless thought it. Tom and his host made no permanent converts, notwithstanding their weekly lessons; though they yielded a point in deference to European prejudice, and instead of helping themselves from the mass by tearing at it with their fingers, allowed portions to be cut off and handed to them on knife or fork. But there all innovation ended. As soon as it came to hand, it was pressed between the palm, rolled into a ball, and laid on the cloth beside the plate containing the sauce, and on the left of it. From this ball, say about three inches in diameter,

smaller masses were torn as required, and the remainder rolled into form again, and deposited in its old place beside the plate, while the bit in hand was used in the following manner:—A fragment, sufficient to make a ball of about an inch in diameter, was separated, well kneaded between the right finger and thumb, rolled into a bullet on the palm of the left with the two first fingers of the right hand, stuck on the tip of the right middle finger, dipped partially into the sauce, and finally transferred to the mouth, to glide away into oblivion.

"4. *Nkpong*, or plain boiled cocoes, with a heavy oily accompaniment of vegetable stew, appeared sometimes, served up in the same way, in pot and calabash.

"5. *Usung-nkpong*, or coco-foofoo, was also an occasional dish, requiring on the part of the native guests the same elaborate manipulation, as did the yam foofoo.

"No doubt, a description of the banquet which King Eyo was accustomed to give his native gentry would serve our purpose a great deal better than the above sketch of his "Udia mbakara," or white-man's chop. To that, however, neither I nor any other white man, that I am aware of, was ever invited; and from the solitary glimpse I once got of it, when the party, having dismissed the solids, were enjoying their cups, I should say that the first invitation would infallibly be the last accepted by any white man, not accustomed to eat out of the same trough with his pigs. I have had sundry glimpses of other such feasts at Ikoneto and elsewhere, and always observed the same filthy state of things.

"The occasion on which I found myself, for a few minutes only, in the presence of this herd of swine, was as follows:—By his own account, King Eyo was infested with thieves night and day; and that, in spite of all his ingenious and barbarous punishments,—flogging them till their backs and thighs were flayed, lacing their arms tightly from fingers to shoulders with fine cord, starving them in irons till they could scarcely crawl away when liberated, punching out all their teeth for stealing and eating his goats and pigs, with the barbarous sarcasm that he would limit them to foofoo for the rest of their lives, drowning many in the neighbouring creek, and burning one poor fellow, who had more than once stolen his own person from King Eyo, its owner by purchase. Quite recently, however, a mode of punishment, new to King Eyo, had been introduced by a Dutch captain, who kindly presented him with a pair of Chinese collars, not indeed exactly after the Chinese pattern, but on the same principle, viz., of effectually fixing the neck and wrists, and making the guilty wearer as miserable as it is possible to con-

ceive. King Eyo did not have to wait long for an occasion to bring them into use. Unfortunately, however, the poor fellow, who was the first sentenced to the collar, unable to endure his misery, succeeded in breaking the thing to pieces, for which he was condemned to be thrown into the creek, King Eyo combatting his son's entreaties for the man's life, by observing that he had lots of slaves, but only two collars. We also went to see what could be done to obtain a change of punishment. Having passed through the crowd at the entrance to the outer court of the king's residence,—a crowd whose special duty, as it would seem, on such occasions, was to take up the shout, and hurrah in their peculiar fashion, and at the top of their voice, whenever the king raised the first cup of mimbo to his lips,—we passed on to the entrance of the second court, and had the whole affair before our eyes. Whether we succeeded in getting the thief pardoned, I do not recollect; but most likely we did get some mitigation on his behalf, for King Eyo seldom disobliged us in these matters. At all events, we saw the debris of his genuine Calabar feast. There was the King, seated in an armchair, and his brethren—but for Eyo's sake, I must remark, certainly not his followers—grouped around the board, all in the undress of native full-dress, Eyo being, as usual, at the head. The table appeared to be an extemporised affair, consisting of a few boards laid on two small native tables, one at either end. King Eyo knew the tastes and manners of his countrymen too well to entertain them thus in the hall of his deck-house, where he met his white friends. The filthiness of the table, and of the ground about his guests, was extreme. Greasy debris of the various courses and great splashes of the gushing mimbo disfigured the one, while on the right of each person, the ground was wet with the repeated libations poured out to the ghosts of their fathers, as every fresh bumper of mimbo was about to be drained, and with the portions of the solids thrown to the ground, as offerings to the same invisible participators.

"I have often seen the natives of Calabar at their meals on more quiet occasions, particularly during my stay at Ikoneto; but everywhere their table manners were still the same, especially in the case of the men. I have caught old Ofring, the senior chief, at his early morning repast of roasted plantains and vegetable cheese, roasted yam in slices, and fresh palm oil mixed up with bruised dried shrimps and red pepper and salt; at his regular breakfast, about mid-day, which might be of any of the dishes that have been named, but was ordinarily of the favourite foofoo; and at his supper at sunset, where the same cookery was in fashion. He

usually took his meals in the open veranda, where he reclined all day; a small native-made table, standing on two pairs of crossed legs, being brought and set before his earthen couch for that purpose. No cloth was used; the dishes came to table as previously described; and though accompanied by knife, fork, and spoon, these were only used when the teeth were inapplicable, when portions were to be transferred from the calabash to the plate, or when the remaining sauce was to be supped up; his stiff, rheumatic fingers not being capable of the dexterous use which younger natives make of theirs, as soup spoons.

"The calabash, so universal on the west coast of Africa, is a large gourd. In some parts, as among the Foulahs, these gourds are divided vertically, perhaps for the sake of economy, thus making two dishes, but with no proper base for them to stand upon. In Calabar, however, the practice is to divide them horizontally, rejecting the upper half entirely, the part reserved for use having the natural base of the gourd, which forms a good broad bottom. The pots, used for cooking their sauces, are made of clay, only partially burnt, and easily broken. In shape they are like a wide-mouthed shallow bowl, resembling most aptly the broad end that we cut off our eggs at breakfast, and requiring the Ekara, or quoit-like affair, to serve as a stand for them when set on the table."

ANDREW MURRAY, F.L.S.

DURING the latter half of February, the seizures in the city of London, of meat unfit for human food, amounted to 3,772 lbs., represented by 43 sheep, 4 pigs, 8 calves, 19 quarters of beef, and 25 joints of meat. Eight sheep were also discovered in a frightfully diseased condition in two salesmen's shops in the New Meat Market. We should be glad to learn whether, in such a case as this, the senders only are liable, and whether the aforesaid salesmen, in default of any strict legal punishment, cannot be drummed out of the market with the honours usually associated with the "rogues' march?" A number of Hungarian pigs, afflicted with parasitic disease or measles, are also in circulation in the probable form of sausages; so that, at least, for the present, consumers who are at all particular on this point had better refrain.

EXHAUSTED TEA LEAVES.

At one period of this country's history, many of the luxuries of life (since become necessaries), on account of their expense, were vended by only a few dealers, and confined to the tables of the rich. Under such circumstances, the temptation to tamper with their purity was limited; and when adulteration occurred, the superior intelligence and information possessed by those who could afford to use such luxuries, usually brought about speedy detection and punishment. This state of things is, unfortunately, in one sense, entirely altered now. The pure luxuries of a past generation have become the adulterated necessaries of the present; the rich man may occasionally enjoy his butter, his coffee, and his congou, devoid of horrid suspicions of tallow, chicory, and exhausted leaves; but, notwithstanding the revelations of chemistry, the poor man cannot,—up to the present he does not.

Public attention has recently been called to the report made by Dr. Letheby, the medical officer of health to the city of London, on the subject of the sale of spurious tea.* With such a repulsive description before us of an article which yields, or ought to yield, the most fragrant of all infused beverages, it may be instructive to glance at the composition of good, sound tea, with a view to ascertain what ingredients are eliminated by infusion; in other words, how leaves become exhausted.

The following are the analytical results of some of the best specimens of tea obtainable, at the periods when the chemical examinations took place, and are compiled from the researches of Johnston, 1853; Mulder, 1861; and others, in 1869:—

Composition of Pure Dry Tea.

	Chinese.		Java.		Assam.
	Green.	*Black.*	*Green.*	*Black.*	*Black.*
	Per Cent.	Per Cent.	Per Cent.	Per Cent.	Approximate. Per Cent.
Volatile Oil	0·79	0·60	0·98	0·65	0·57
Chlorophyll	2·22	1·84	3·24	1·28	1·79
Wax	0·28	—	0·32	—	0·39
Resin	2·22	3·64	1·64	2·44	2·70
Gum	8·56	7·28	12·20	11·08	8·03
Tannin	17·80	12·88	17·56	14·80	20·11
Theine	0·43	0·46	0·60	0·65	3·37
Extractive Matter	18·46	19·88	21·68	18·64	19·70
„ Deposit	—	1·48	—	1·64	1·90
Extracted by Hydrochloric Acid	23·60	19·12	20·36	18·24	16·70
Albumen	3·00	2·80	3·64	1·28	2·22
Woody Fibre	17·08	24·78	13·02	23·94	17·17
Ash	5·56	5·24	4·76	5·36	5·35
	100·00	100·00	100·00	100·00	100·00

* See Page 168.

The following are the proportions of theine, the most important constituent of tea, as found in various samples at different times, by Stenhouse:—

In Hyson	1·05 per cent.	In common Congou	1·02 per cent.
„ Twankay	0·98 „	„ Bohea	0·70 „
„ Fine Congou ..	2·13 „	„ Assam	1·37 „
„ Average	2·00 „	„ Kumaon	1·09 „

and by Péligot:—

In a mixture of equal parts of Gunpowder, Hyson, Caper, and Kaisou Teas	2·70 per cent.
„ Hyson alone	2·40 and 2·56 „
„ Gunpowder alone	3·05 „ 4·01 „
By a more complete experiment	6·21 „

The nitrogenous constituent of tea, according to the last author, has been ascertained to be:—

In Pekoe	6·58 per cent.	In Gunpowder ..	6·15 per cent.
„ Souchong ..	6·15 „	„ Assam	6·10 „

And when the leaves have been exhausted by boiling water, the result stands thus:—

100 parts of Gunpowder tea yield—

Water	10 per cent.	Comprising	Volatile Oil ..	0·5
Extract	47 „		Theine	6·0
Exhausted Leaves	43 „	Containing	Legumine ..	12.0
	100			

100 parts of Souchong tea yield—

Water	8 per cent.	Comprising	Volatile Oil ..	0·5
Extract	43 „		Theine	6·0
Exhausted Leaves	49 „	Containing	Legumine ..	14·0
	100			

The exhausted leaves contain much vegetable matter insoluble in boiling water, but which is readily given up in the presence of an alkali. Taking advantage of this circumstance, the tribes of Central and Northern Asia, who care little for flavour, mingle their tea, which has previously been boiled in alkaline steppe water, with fat and flour, consuming the whole as a broth.

Under any circumstances, therefore, it is a misnomer to call infused tea leaves "exhausted," as they still contain a large proportion of such material as we every day consume in the form of bread, beef, and vegetables; viz., in Souchong, 4·6 per cent., and in Gunpowder, 4·40 per cent. of nitrogen. It needs but a glance to see that, apart from any putrefactive decomposition which may be discovered in re-dried tea leaves, they are not unfit for human food, if consumed as a vegetable.

The use of leaves which had "passed through the pot," as a means of increasing the bulk of tea retailed by certain grocers of "easy virtue," was conspicuously brought before the public by Mr. Phillips, of the Inland Revenue Office, twenty-six years ago. He

then remarked:—"In the year 1843 there were many cases of re-dried tea leaves, which were prosecuted with vigour by the board, and the result was, so far as we could ascertain at the time, the suppression of the trade. It was supposed, in 1843, that there were eight manufactories for the purpose of re-drying exhausted tea leaves in London alone, besides several others in various parts of the country. The practice pursued was as follows:—Persons were employed to buy up the exhausted leaves at hotels, coffee-houses, and other places, at 2½*d.* and 3*d.* per lb. These were taken to the factories, mixed with a solution of gum, and re-dried. After this, the dried leaves, if for black tea, were mixed with rose-pink and black lead, to 'face' them, as it is termed by the trade."

In those days, it will be remembered, owing to the enormously increasing consumption arising from various causes, the inducement to adulterate was much greater than it is now, and the duty levied was 2*s.* 2½*d.* per lb. Coming to a more recent period, we find that on the 18th December, 1850, the excise authorities seized a quantity of material in Liverpool, expressly prepared for tea adulteration, which possessed the negative merit of containing no tea at all. It consisted of broken sycamore and horse-chestnut leaves, stuck together and rendered astringent with catechu. During the following year another pleasant little episode in the way of sophistication came to light in the classical region of Clerkenwell. The *Times*, of May, 1851, gives a description, which we abbreviate:—"Edward South, and Louisa his wife, were charged with being concerned in the manufacture of spurious tea. The officers had been to their house, where they found the prisoners engaged in the operations. There was an extensive furnace, before which was suspended an iron pan, containing sloe leaves, and exhausted tea leaves which they were in the practice of purchasing from coffee-shop keepers. On searching the place, they found an immense quantity of used tea, bay leaves, etc., for the purpose of manufacturing illicit tea, and these were mixed with solution of gum and a quantity of copperas. The heat was so excessive that the officers could scarcely remain, but the prisoners did not seem at all oppressed. The woman was employed stirring the bay leaves and other materials with a solution of gum in the pan; and in one part of the room there was a large quantity of spurious stuff, the exact imitation of genuine tea. In a back room, were found nearly 100 lbs. weight of re-dried tea leaves, bay leaves, and sloe leaves, spread on the floor, drying. The prisoners had pursued their nefarious traffic extensively, and were in the habit of dealing largely with grocers, chandlers and others, especially in the country."

That such vile practices are by no means obsolete, we observe from one of the occasional notes in the first number of this journal; but it is to be hoped that public indignation, once more aroused, will have the effect, through judicious legislation and the continual employment of analytical chemistry, of curbing, if not altogether eradicating, tea adulteration.

Already the community feels the sting, and it is a significant fact that the 7,000,000 lbs. of trashy tea, alluded to in Dr. Letheby's report as being under the ban of the city authorities, almost exactly correspond with the quantity of good tea, short last year in the imports from China, as compared with those of 1868.

It must be evident from the foregoing, that the time has passed away when we need hold up our hands and roll our eyes in holy horror at the iniquity of the Chinese. Surely it were better to mingle our frugal Congou with Maloo mixture, over which the nimble Shanghai pigs had gyrated, and China dogs gamboled, rather than return to the days of slow poisoning by arsenite of copper, chromate of lead, bay leaves, sloe leaves, and catechu.

WILLIAM COCHRAN, M.R.A.S.

IF it be possible to say anything in favour of *octroi* duties, it is that they help us to a few special statistics. The director of the *octroi* of Arras has just published the following account of the quantities of alimentary substances taken into consumption in that town, of 26,216 inhabitants, during the year 1869:—Oxen, cows, calves, sheep and lambs, weighing alive, 2,536 tons; fat pigs, weighing alive, 259 tons; fresh meat, except pork, 111 tons; pork, and salted, prepared, or cooked meats of all kinds, 16½ tons; 71,971 fowls and ducks; 1,441 fattened fowls; 1,229 turkeys and geese; 13,331 rabbits; 42,619 pigeons; 2,288 hares; deer and wild boars, 700 lbs.; 12,526 partridges; 3,692 snipes and quails; value of salt water fish, £3,884; fresh water fish, 9 tons; 109,427 oysters; herrings (salted and pickled), 32 tons; prunes, grapes, figs, and almonds, 111 tons; 3,056 melons; truffles, 800 lbs.; wine, 202,500 gallons; cyder, 11,000 gallons; and beer, 1,221,000 gallons. The consumption of butchers' meat was not quite equal to 30 lbs. per head of the population; to this may be added 150,000 heads of poultry and game. The wine amounts, on an average, to less than 9 gallons, and the beer and cyder to 47 gallons per head. Arras being a walled town, there can be scarcely any production of food whatever within its limits, so that the above must be considered as a complete account of the total consumption.

DOMESTIC RECIPES.

The Editor desires to appeal to his readers, and especially to the ladies, for contributions of recipes for cheap, tasty, and serviceable dishes, both for poor households and those of the higher classes.

THE VOCALIST'S SOUP.

Take three ounces of sago, and, after washing it in boiling water, add it gradually to about two quarts of medium stock, which should be almost boiling. After half-an-hour's simmering, it will be well dissolved. Beat up the yolks of three eggs, add half a pint of boiling cream, and stir them all quickly in the soup, not allowing the latter to boil, lest the eggs should curdle. These materials will make sufficient soup for eight people, so that it can be recommended for dinner before an amateur concert.

POTTED PIGEONS.

Stew the gizzards and livers of the pigeons, chopped fine, and add grated ham, bread crumbs, and herbs. This is to be made into a force-meat, with the yolk of a hard-boiled egg, and the pigeons are to be stuffed with it. Put them into a stewpan, with water and a little butter; add the gravy from the gizzards, some flour, and an onion, with the addition of a glass of wine, and stew gently until done.

VEAL SOUP.

Boil the veal with two-thirds of a cup of rice, and add sweet herbs or celery, and the usual seasoning. This makes a plain, wholesome soup.

THE PRESERVATION OF MILK.

The following recipe appeared in *Cosmos*:—"To every litre (= 1¾ pints, 5 oz.) of unskimmed milk, previously poured into a well-annealed glass bottle, add 40 centigrammes (about 6 grains) of bicarbonate of soda. Place the bottle (which must be well corked) containing the milk for about four hours in a water-bath, heated to 90° (194° Fahr.). On being taken out, the bottle is varnished over with tar; and, in that state, the milk contained in it will keep sound and sweet for several weeks."

POTATOES À LA MAÎTRE D'HÔTEL.

Peel the potatoes, when boiled, and, after trimming them into the shape of large corks, cut them into slices half an inch thick; then place them in a stewpan, with sliced green onions and minced parsley, pepper, salt, and butter. Moisten them with stock, and let them be well tossed, until the parsley is cooked.

HARE À LA ST. HUBERT.

Persons who object to "high" game will find the following recipe most useful. The dish is called *Hare à la St. Hubert.* The hare must first be skinned soon after death, put into a copper, and great care taken to save as much blood as possible; secondly, four ounces of bacon fat are to be added, with leeks, parsley, etc.; and, lastly, a pint and a half of good, strong, spirituous red wine. The copper is then to be hooked on a pot-hanger, and the wine set on fire. While this is flaming, roll six ounces of butter in some flour, and when the wine ceases to burn, add the butter rolls to the stew, which may be allowed to remain on the fire for half-an-hour. A veteran French spinster, whose word on such matters is law, bids us, on eating the dish, bless the memory of the propitious saint. A hare, thus cooked, merits this effusion of gratitude.

HOW TO COOK TOUGH POULTRY.

Madame Miau is, what may be called, an Anglo-French authority on culinary operations. At least she was born in England, educated in France, came back to England, studied, talked, cooked, and ate a great deal in both countries. A friend in extremity once asked her, what she could do with "a miserable half-starved chicken that the dogs had killed?" Her answer was prompt, and encouraging to those mistrustful people, who are compelled to dine in doubtful eating houses. "Truss it neatly," Madame Miau replied, "stuff it with sausage and bread-crumbs; mix some flour and butter, taking due care it does not colour in the pan, for it must be a white rout; plump your chicken in this, and add a little water, or soup if you have it." We are told besides to put carrots cut in half, tops of celery, chives, bay leaf, parsley, etc., then "cover close, so that all air may be excluded, and keep it simmering two hours and a quarter; it will turn out white and plump; place the vegetables round it, stir in an egg to thicken the sauce, off the fire, and your dish will make you blush." Without actually snatching half-starved chickens from the mouths of dogs, might not Madame Miau's instruction render many a tough old bird palatable?

NOTES OF THE MONTH.

We have received a pamphlet, by Dr. Rumsey, of Cheltenham, entitled, "Some Population Statistics for Sanitary Organisation." We hope, ere long, to be favoured with an article on this very important subject, by the author of the pamphlet, who is certainly the first to show us the way to a practical organisation, or grouping of towns and districts, for sanitary purposes, according to the physical features of the country, by which there would be a great enlargement of existing areas of sanitary administration. Dr. Rumsey has at present only sketched out his proposed areas, and has limited his fuller description to the county of Gloucester, showing that the system which appears so easy to carry out there, may equally apply to all England.

The arrival of the "Ariadne" at Falmouth, from the River Plate, with a cargo of 144 bullocks, 300 sheep, and a few cows and calves, all in fair condition, marks an era of great importance in the increase of our meat supplies. We learn that only 12 deaths occurred during the voyage, which was an exceptionally bad one. This is all the more encouraging, and takes away the question from the region of experiment to that of practicability. We are exceedingly glad for the promoters of the enterprise, and the public generally, that the opinions expressed in the "Food Journal"* on this question have been so soon realised.

The "factory" system for making cheeses, which is almost exclusively pursued in America, is about to be tried on a large scale in Derbyshire; and, considering the old fashioned prejudices of many of our farmers, it is a bold and spirited experiment. Shardlow, a village about seven miles from Derby, is the first locality selected, the produce of 300 cows having been guaranteed, and the owners having agreed to accept the price of 6½*d.* per gallon for the milk, and a share of the profit. Thus the farmer will obtain a certain and ready sale for his milk, while cheese making will be rendered remunerative. Almost all the cheese is now produced in this manner in America; the factories being sometimes conducted on the mutual principle, and sometimes owned by one or more persons, who contract for the milk. The first cost of a factory capable of working up the milk of 600 cows is about £600.

* See No. 1, page 10,—"On the Meat Question."

We are glad to see that Mr. Muntz, M.P. for Birmingham, has brought in a new Bill to prevent the Adulteration of food or drink. The last Act having been passed in 1860, there is now room for an Amended Act, of more stringent application. In perusing the proposed Bill, we are sorry to see that, by clause 3, the power to appoint analysts is placed in the hands of the vestries and district boards for London, and of the Town Councils of the various provincial towns. These are obviously not the parties with whom the selection of analysts should rest, for, speaking broadly, such an appointment ought not to be subject to, or influenced by, the numerous petty local interests which usually prevail in these bodies. We think also, that the penalty proposed for the first offence might be modified, while at the same time, a greater amount of publicity should be given. To a prosperous tradesman, whose conscience is not over sensitive, a fine has very little real deterrent effect. The fear of publicity acts much more strongly; and we should be glad to see the name of the shopkeeper who knowingly sells adulterated food, and that of the man who prepares such food, placarded for six months on the door of every market-place, church, and police station in the county in which the offender dwells, together with an advertisement of the same in the local papers.

The discovery of spurious tea, by Dr. Letheby, is a very serious matter, looking at the enormous quantity already brought over to this country, and the still larger supplies, said to be 7,000,000 lbs., which are reported to be on the way. This tea, which is described as "Fine Moning Congou," is really nothing but the re-dried leaves of the exhausted tea, the peculiar piquancy of which is increased by the fact that, in Shanghai, the pigs and dogs freely promenade amongst the rotting heaps in the streets. "The leaves are for the most part quite rotten from the putrefactive decomposition, and do not contain more than a trace of the active principle of tea. The odour of them is very offensive; and, when infused in boiling water, they produce a nauseous, unwholesome liquid." The value of this precious article is from 1½*d.* to 2½*d.* per lb., though for purposes of adulteration it has already been sold for from 5½*d.* to 7¾*d.* per lb. We regret to observe that the prosecution of the guilty parties has been to a great extent rendered abortive, by the action necessarily taken by the Custom House authorities. If nothing else, however, results from the discovery, it will put an end to the fraud—at all events, for a time—and in this particular guise.

THE

FOOD JOURNAL.

THE POLICY OF THE FOOD JOURNAL.

THE time has now come, when may be taken more fully into consideration the uses that can be made of the influence which the "Food Journal" has acquired. Having reached the ear of the public on matters for which there was previously no organ, and the importance of which is truly national, it remains to be determined how this speciality shall be applied. Shall it be solely reserved for the consideration of details, or shall it grasp the higher duties of giving effect to the knowledge which the possession of a large body of contributors enables it to accumulate? Shall it, in a low sense, be a mere record of cheese-parings, Welsh rarebits, sinks and dust-bins, or shall it ensure for rich and for poor, by its action, the results of a real national economy? To form public opinion is one of the duties of a journal; but, having formed it, it is then essential to give a direction to it, and to bring it to bear on the representatives of opinion, the legislature, and the government of the nation. This is the real practical result to be achieved, because, until many food and sanitary questions are made matters of Government duty, no general effect will be produced.

The conductors of this journal may expose adulterations, but it is the action of the Government which alone can apply the remedy. and even in this respect we know how defective it is. Seven million pounds of poisonous tea are sent to this country to defraud and injure our people, but they have not any efficient protection. The English consuls in China give no warning, although the purchase and shipment are announced in newspapers published in China in the English language. The Foreign Office does not learn of this, nor does the Board of Trade, and so neither department moves. A local officer gives the alarm. Dr. Letheby, who is simply the officer of the city of London, in the zealous discharge of a public duty, appeals to the Corporation of the city. He has not the

power, as he ought to have, nor has he even the appearance of the support of the Government, to deal with this pestilent fraud. It is because there is no adequate organisation. The individual can no more protect himself against danger of this kind, than he can against the criminal classes; it is the action of the community alone that can protect him, and that action must be organised.

There is, however, it is notorious, no organisation for food and sanitary administration. What is worse, is that, although there are some germs of special departments, there are not the ministries which are essential for proper organisation and co-operation, and which are to be found in every Continental country, from the Channel to the Bosphorus.

Which want shall we name first? There is no Minister of Education; and education, the intelligence to produce and use food, and to maintain the public health, is a necessity even like food. There is no Minister of Agriculture, no Minister of Commerce, for the Corn Law Returns do not constitute an agricultural department; and the Board of Trade, designed more than a century ago as a Ministry of commerce, of trade, and of plantations, is less so than ever, and is only an administration of miscellaneous departments. Mr. Bright made no jest, when he said he did not know what his ministry was. There is no Ministry of Justice, to give us systematic action against poisoners of the public food and disturbers of the public health. There is no Minister of Public Works, to carry out the appliances for sanitary defence and the general welfare.

A conviction is growing up among leading economists, that there must be administrative reform by the deposition of the anomalous departments, and the constitution of proper ministries; and as in such reform the supply of food and the care of the public health must be provided for, it appears to me that the ultimate and higher mission of the "Food Journal" must be to promote this action. This is what I understand by the journal having a policy—a policy, at all events, not of parties, and not of classes, and which is the one policy which equally concerns rich and poor. There is no one so wealthy that he can rest satisfied with his own abundant means for the purchase of luxuries. He must feed the sailors and the soldiers, who protect him; he must feed the veriest starving poor, or they will breed thieves and robbers to molest him; whilst at the same time causing diseases, which will reach him in his house, and strike him in his bed. Such is the chain of influences which binds all in these questions, when they come to be properly understood.

To be properly understood is, however, the fate of few of these questions. They are dismissed from the mind with no consideration of their intrinsic importance—with the notion that it is a preference of one matter of theory for another, whether a particular thing be done or not. It is this want of information and intelligence, which is the cause of much of our evil. The persistence of some legislator or economist carries the principle of a useful measure, but the reform is never fully accomplished, because some one is allowed to step in and arrest it, or because other ideas are introduced to counteract its effects. Matters are left to the casual exigencies of public opinion, and the capricious action of legislators and journalists. True, this is the expression of public opinion,—and it is said the country is governed by it,—but it is the spasmodic expression of public opinion, and that without, in most cases, having the proper means of operation. In order that it may effectually act, there must be a public department on which it *can* act. With regard to penny postage, we could accomplish this reform, and perfect it, because we had a department on which to act. When the officials impeded Rowland Hill, public opinion secured his mastery; now that the department is getting behind the rest of Europe, Mr. Graves demanded halfpenny postage, and public opinion has again settled the issue.

Turn to the education question. So long as there was no Government representative, education was left to individual and social action; no minister could be got hold of; so that, amongst them all, it was nobody's business. Even since the queer arrangement of turning over education to the Cattle Plague Committee of the Privy Council, there has been progress, for we have had somebody who could not say it was not his business, though he had neither staff nor funds (nor, it may be said, time, amid multifarious duties) to accomplish adequately the object demanded. The President of the Council was, however, made a channel for addressing the legislature, and for obtaining positive legislation; so that, step by step, after partial acts, we reach the stage of a National Education Bill, notwithstanding public apathy and the bitter conflict of sects and parties. Surely we shall do more when we have the means, in those things which are neither matters of sect nor of party, but of national concern.

Subordinate to the constitution of ministries, is the establishment of departments in relation to them. Some of these departments exist,—indeed most of the material for the ministerial staff,—so that the required reform is not one demanding increased expenditure, but only organisation. The Chancellor of the Duchy

of Lancaster may go; the Privy Seal may have something more to do; the Vice-President of the Council may become a Minister of Education; the President of the Board of Trade may assume his true functions as a Minister of Commerce, and his Vice-President act as Minister of Agriculture; while the Minister of Public Works is supplied from the Chief Commissioner of Works. The men are there, interfering with each other, or not doing the right work. They have to be sorted out, so that each may have his right functions; that we may have responsible men; and that, so far as may be, each shall have a competent staff. This will be supplied from the departments, and, when the departments are properly brought together, they will supply in their co-operation the men for the additional duties. We have reason to expect that there will be no increase of public expenditure, but a great increase of efficiency, a diminution, perhaps, of copying clerks or public servants, as they are called, but an addition to the intellectual staff.

It will never be possible so to allot departments, that their relations will be confined to one minister; but by distributing them more suitably, we shall ultimately bring them into better connection with the several ministries which their operations concern. The Agricultural Census and the Corn Law Returns may, as matters of statistics, be under the statistical office of the Ministry of Commerce (Board of Trade), for statistical administration; but their bearings on the Ministry of Agriculture may come under the care of an officer of this ministry. Step by step the simple compilation departments will be amalgamated and reduced, and those officials who deal with results will be increased in number. As to the Board of Trade, it is too evident that its officials do not meet with adequate ministerial support, for the Board of Trade is treated as a refuge for sucking ministers, and its presiding officer is not necessarily a member of the Cabinet. Under reform, the attribution of the functions of the Minister of Commerce will give weight and influence to the administration of such a department, directly responsible to Parliament and to public opinion.

So far as a Minister of Agriculture is concerned, it is unfortunate rather than fortunate for England, that our high pitch of agricultural advancement has not driven us into the immediate necessity of a Ministry of Agriculture, as the backward condition of husbandry has enforced on France and the Continental countries. We have even lost our Department of Agriculture in the gradual vanishing and wearing out of the original functions of the Board of Trade. True it is, a Minister of Agriculture in England would not be obliged, like his brother in France, to hold agricultural shows,

furnish prizes and distribute medals; it is not necessary for him to introduce English machinery, or to send employés into England to report on agricultural progress and improvement. It is unfortunate that our necessities have not hitherto been sufficient to make the appointment of such a minister here compulsory; but it is so far fortunate that his functions would be narrower than they are abroad, though at the same time not unimportant.

If we had had a Minister of Agriculture, the reclamation of wastes or enclosure of commons would have proceeded with more order; earlier provisions would have been made for the drainage of settled estates; but, above all, had there been such a Minister, it would have been impossible that in the last twenty years manure sufficient to grow 400 million quartern loaves could have been consigned to pollute the rivers, and waste in the sea. Such a minister, with a few clerks, would have looked after these and other matters. He could, also, have enquired into the cattle plague, and he would long ago have organised an agricultural census. His small yearly blue-book on the state of agriculture would have let us know, step by step, how far we were right, or how much we could rely upon; and more than that, it would have enforced on us our deficiencies. It is not an expensive administrative staff which necessarily follows from the establishment of a ministry,—it may be a small staff,—but it is the constant and organised supervision, and the adequate enforcement of responsibility, which does the effective work.

The Minister of Public Works would require a larger staff; but, after all, his duties are those rather of supervision than of execution, and his yearly reports would systematise our action, and ensure our steady prosecution of right ends and of the common interest. Such is in brief the task which is yet to be accomplished; it involves one of the cheapest reforms yet proposed, but it is one which will bring greater and more lasting fruits than even army or navy reform; and if the "Food Journal," by becoming the organ of well conducted action, can promote the result, it will have accomplished its mission, which will ensure for it solid reputation and grateful recognition.

HYDE CLARKE.

VEGETABLES BETTER THAN NOTHING.

WITHOUT advocating the views of absolute vegetarians, it is certain that much more sustenance might be derived from vegetables than is now obtained, by those who cannot afford a proper quantity of meat; and this remark applies more especially to England. The cause is simply ignorance, prejudice, lack of imagination and ingenuity among the poorer housewives; while the more wealthy and educated have not the stimulant of need to enforce their investigation of the matter. Abroad, a thousand and one contrivances have replaced in poor families the use of meat; in England, the poor, of our cities especially, console themselves for the absence of animal food by drinking, for the most part, poisonous spirits. To remedy these evils, good teachers and willing pupils are wanted; but in England the poor decidedly object to learn, and no one has had the courage to attempt to teach them. Burke's immortal maxim about the Englishman's castle has done in this wise some harm. Let us imagine a bold philanthropist, who would enter an Englishman's home and teach his wife how to select and cook vegetables, after scientific rules, for the general advantage and economy of the family. What a desecration of the freeman's dignity—what unwarrantable interference in domestic affairs; in a word, an Englishman's house would be no longer his castle. If, however, it is impossible to give lessons personally, the press might have achieved the work, or at least assisted in it. But this is not so, and it is to the discredit of that great power; nay, more, it proves that the press is not altogether free from the empire of selfishness. The poorest have been made to sympathise with the political interests of their newspapers, to the advantage of party or individuals; but nothing has been done to teach them how to mind their own particular domestic affairs. Far be it from me to deny the political advantages enjoyed by the poorest classes of England—advantages which have been fought for and won by the cheap press. But is it not of equal importance to keep the poor from partial starvation, and the "drink of despair," by teaching them how they can derive, I may boldly say, double the advantage from their expenditure? This has hardly ever been attempted, and for this

purpose it would be well to investigate how far vegetable matter can be used as a cheap substitute for meat thus proving itself better than nothing.

Undoubtedly great sustenance can be derived from vegetables. Vegetarians can give us many examples to prove that not only will vegetable matter alone sustain life, but that meat is injurious. Without going so far, I limit myself to one or two instances, proving that we are not absolutely dependent on meat, and that in its absence, or with a very small quantity of it, good health and strength can be secured. Volney, a well known, though not a recent authority, describes the Wallachians in his travels as "tall, well-built, robust, and of a very wholesome complexion, diseases being rare among them." Further on we are told, "the manners of the Wallachians, as far as I have been able to judge them, are simple, and neither embellished nor sullied by art. Temperate in their repasts, they prefer vegetables to fruit, and fruits to the most delicate meat." The miners in Belgium furnish another good example. They eat, according to a report made in the locality, 2 lbs. of bread per day, about 2 ozs. of butter, 1 oz. of coffee and chicory mixed, while for dinner they have in the evening a portion of vegetables mixed with potatoes, weighing at the most 1½ lbs. They have meat on Sundays and festivals, but during the week they drink neither beer nor other fermented liquors. Coffee is their only beverage. Yet these workmen are hardy and healthy. It is not the coffee which sustains them, for it constitutes but 1-35th of the nutritious properties of their aliment, though M. de Gasparin, in a paper read some years ago before the French Academy of Sciences, attempted to prove, from certain tables, that the waste in liquid excretion is less where coffee is drunk than at other times. The miners' coffee is not like the French *café au lait*, for it has but 1-10th part of milk in it; he drinks several pints in the day, and eats only bread and butter until the vegetable meal of the evening. The albuminous substance which enters into the rations of the Belgian miner is thus reduced from 23 grammes to 15 grammes of azote. This is less nutritious even than the diet of the monks of La Trappe at Aiguebelle. Here is, therefore, proof that life and health can exist throughout a whole population with less nutritive substance than is generally considered necessary; that meat can well be replaced by vegetable and farinaceous matter. But it will be argued, that the impoverished British workman and pauper will object to the diet of the Belgian miner. In answer, however, might it not be suggested that the Belgian acts with greater wisdom when he preserves his health and spirits even on such a miserable diet, than the English-

man who, constantly aiming at nothing less than the sirloin, falls short of the goal, and consoles himself with spirituous liquors. There is fortunately a medium course, and much despair might be avoided if our poor, and indeed some of the lower middle classes, knew better how to combine vegetable substances, and produce excellent meals, without any assistance at all from the butcher. Occasionally a good wholesome vegetable diet would be better than nothing; and, by refreshing the blood and assuaging thirst, would lessen the temptation of drink, always so great in moments of feverish anxiety, poverty and want. Without adopting the miner's diet, many a good meal can be made for a few pence from vegetables, cooked with more art than at present shown. It would take too long to analyse all the different vegetables at hand; but I will, on a future occasion, return to the subject, and for the present content myself with a few practical examples illustrative of my meaning.

For a cheap, yet tasty and substantial dish, let me suggest that the housewife grate two carrots, two turnips, one parsnip, a little beet-root and artichoke into one pint of split peas, boiled in two quarts of soft water for two hours. The whole might then be boiled with three teaspoonfuls of Indian, wheaten, or Scotch meal, mixed in cold water, leaving it to simmer together for two hours more; a little parsley, mint, and thyme will flavour the dish. More water might be added if necessary. This somewhat complicated "hodge-podge" would well satisfy a middle-class family, and cost less, at any rate, than a joint. It would not do, perhaps, every day, but might occasionally save the meat and avoid the horror of stinting at dinner. For a cheaper dish, why should not the lentil be introduced for everyday use in England as in France? For instance, let a pint of lentils be soaked in pure soft water for twenty-four hours, then put in a stewpan (earthen or enamelled is best), and boiled for four hours. Then two onions, one parsnip, one carrot, a little parsley, thyme cut small, and a small quantity of boiled rice should be added. This, mixed and boiled a short time together, would produce a satisfying and savoury dish, somewhat better than the diet of the Belgian miner, and yet very cheap. Lentils are about the most nutritious vegetable we possess. In 100 lbs. they contain 84 lbs. of solid matter, and 16 lbs. of water, of which 33 lbs. are of flesh-forming, and 48 of heat-forming principle; while butchers' meat, according to Baron Liebig's table, has but 21·5 lbs. per cent. of flesh-forming principle, and 14·3 that gives heat. The rice has 82 per cent. of the heat-forming principle. Compared with these, the other vegetables are more useful as giving water, flavour, and rendering the dish light and digestible. The celebrated Indian and Chinese

dish called *dahl*, has also lentils for its chief ingredient, and is purely of vegetable matter. It is substantial and delicious, and is made as follows:—Stew a quart of split lentils till they form a thick soup; have ready a pound of rice, well boiled in milk, and drained off as dry as possible. Shake the rice up loosely in a dish, and, after mixing an ounce of curry powder with the lentils, pour the lentil soup over the rice and serve it up. Dishes, cheaper even than these, may be made palatable.

Before concluding, however, there is one important objection which has often been made, through ignorance of the first rule in cooking vegetables. It is observed that a meal from them is not satisfying. I have found it frequently happen that the persons who thus objected, did not know even how to boil a vegetable. The rule is simple, but must never be forgotten. Every kind of vegetable intended to be served whole should, when put to boil, be placed at once in boiling water; and this applies especially to potatoes, and vegetables from which the outer cover has been removed. Now it often happens that potatoes, etc., are, to save time, placed in cold water and left to boil gradually. It is just this which allows the nutritious matter to escape, and renders the meal unsatisfying. When, on the contrary, the water boils from the moment the vegetable is immersed in it, the albumen is partially coagulated near the surface, and serves to retain the virtue of the vegetable. The reverse is, of course, the rule for making soup, or any dish from which the water will not be drained. By placing the vegetables in cold water the albumen is slowly dissolved, and actually mixes with the water—a process most necessary for the production of nutritious soup. It is to be hoped that the poor, who have a special need for the most their money can produce, will learn, in whatever haste they may be, not to boil all the albumen from their potatoes, reserving for their meal only the starchy matter.

ADOLPHE SMITH.

A NEW utilisation of waste material is reported, from the Brindisi district, in the oil trade. Formerly the olive husks, as left by the common oil presses of the country, were used by the peasantry only for fuel, but a French speculator is now buying them, at the price of 20f. per ton, and shipping them to Marseilles, where, after undergoing some chemical process, they are put into a steam press and made to yield 20 per cent. of oil. The Brindisi people are themselves erecting a press, capable of operating upon 70 tons of husks per diem.

PUBLIC HEALTH.

Part IV.—VITAL STATISTICS (continued).

The Act for the Registration of Births, Deaths, and Marriages was passed in the year 1837,* and it will be necessary to dwell fo a few moments on the machinery by which it is worked, if we are to understand the true bearing of this important measure on the Public Health, and the impetus which it undoubtedly gave to sanitary inquiry and sanitary work through the length and breadth of England.

Registration Districts.—Reverting for a moment to the first introduction of the Act, it will readily be understood that one of the first considerations would be the division of the country for the purposes of statistical returns; and it would be of the utmost importance, in more ways than one, that the areas selected for the new returns should be identical with some at least of the well known divisions already existing. In a country like England, where shires, tithings, hundreds and parishes, parliamentary boroughs, municipal boundaries and Poor Law Unions interlace and overlap, in the most inextricable confusion—where no less than five hundred parishes are divided by a county boundary—the choice was naturally one of extreme difficulty. The Poor Law Union was eventually selected as the most useful for the purpose, and the fifty-two counties of England and Wales were distributed into 640 districts (squares of ten miles or so to a side), which coincide generally with the divisions under the Poor Law administration, and constitute the *Registration Districts* of the Registrar General. The further sub-division of these districts was into 2,202 *sub-districts*, containing from one to seven parishes each, according to their acreage and density of population. Now, if towns could be controlled in their growth, and kept within ancient boundaries—if sanitary acts and powers were subject to rule, and did not "go apparently in quite a wild way about the country, cutting it up into little sections, taking parts of parishes and parts of districts, and grouping them together in the most arbitrary manner"*—the districts, once

* By a typographical error, at p. 126, the First Report of the Registrar General is said to have been issued in 1837. The Act was passed in that year, but the First Report did not appear until 1839.

* Dr. Farr's Evidence, Sanitary Commission, 1869.

determined, would serve for ever as areas for vital statistics and sanitary organisation; but it is not so. Towns will, unfortunately, spread in defiance of the most venerated landmarks; and we have municipal areas bounded only by common interests of commerce or of health, and overleaping at need, with supreme indifference, the boundaries of the Poor Law and Registrar-General alike.

To take one instance out of many, the returns of sickness and mortality for the city of Manchester are derived from parts of two districts—Manchester and Chorlton, or from eleven sub-districts, of which no less than five are divided, and give part returns only to the city bills of mortality. The population in such cases is unknown, and cannot be ascertained, for the area of sanitary administration is framed independently of census returns and registration districts. The question of districts, therefore, is one of vast importance in connection with public health, and is attracting, as it deserves, the serious attention of sanitarians at the present day. A valuable return, presented to the House of Commons in July, 1868, has shown the number of local boards under the Public Health and Local Government Acts, also of Improvement Commissioners and other bodies under the Local Acts for improvement of towns or districts—there were 610 for England and 41 for Wales—and not a few have been added since that report was published; and when it is mentioned that three-quarters of these contained less than 10,000 inhabitants, and twenty-five less than 1,000—that they are formed, moreover, in entire disregard of areas for statistical returns—the difficulties of health officers and others engaged in sanitary inquiries may to some extent be imagined. Until some check is placed on the random multiplication of sewer authorities and local boards for sanitary administration—until some sort of coincidence is aimed at between districts for sanitary management, and districts for statistical returns of population and mortality, it would seem hopeless to look for such accuracy in the vital statistics of the country as shall make them a trustworthy gauge of the Public Health. I have already dwelt longer than I intended on the subject of districts, and I would refer any of my readers who wish for fuller information to a pamphlet by Dr. Rumsey, entitled, "Some Population Statistics for Sanitary Organisation" (a reprint from the Transactions of the Manchester Statistical Society), in which the defects of our present system are set forth, and some valuable suggestions offered for their removal.

Marriages.—The number of marriages may be taken as a rough test of the general prosperity and well being of a people. Periods of commercial depression, and high prices, leave an indelible mark

cause of death, are recorded in the Register, and a copy of the entry sealed at the General Registry office is evidence of the death, by Act of Parliament, though it is not always accepted. It has been refused, and apparently on no unreasonable grounds, in the Vice-Chancellor's Court (*Times*, March 6, 1844). The Bank of England has declined to recognise it since £5,000 consols were withdrawn by means of a forged will, and a registration certificate, which had been fraudulently obtained during the lifetime of a certain Mrs. Slack. The Registrar in a large town has no means of identifying informants, or verifying the evidence they tender, and so it has happened that a coffin full of rubbish has been followed to the grave with all proper solemnity, whilst the supposed occupant was better engaged elsewhere. A Registrar has been known to give scope to his inventive genius by entering fictitious deaths for the sake of the paltry fee attached to each entry in his books.

These, happily, are rare exceptions; but whilst the bare possibility of their occurrence exists, we cannot be surprised if some want of confidence is felt, and additional safeguards demanded, if the mortuary records are to be deemed indisputable at law and above suspicion. The most obvious remedy is a medical certificate of the probable cause of death, compulsory in every case, and Dr. Farr has expressed himself in favour of some such change; it would, at least, get rid of the glaring anomaly, that the sole evidence on which an entry rests may be tendered by those most interested in falsifying its particulars; and it would be impossible for twenty persons, as in Norfolk, to die from poison administered by one individual, without a single inquest being held.* But it is time to consider more directly the mode in which the death register may be used as an index of the Public Health.

Many plans have been proposed by which the value of life, and, by inference, the conditions affecting it, may be ascertained from the death-roll with something approaching to accuracy; and I would refer those who wish to follow out the subject to a most able article on Vital Statistics, by Dr. W. A. Guy, in the Cyclopœdia of Anatomy and Physiology. I have selected three for illustration in the present paper:—

I. *The mean age at death*, or the sum of the ages at death divided by the number of deaths, would seem at first sight a fair criterion of health and vitality. A people that died on an average at forty

* In the 27th Annual Report of the Registrar General, Dr. Farr's letter, which gives an admirable review of the defects of our present registration system, is well worth reading by all who feel an interest in the subject.

would *primâ facie* seem healthier than a people that died at thirty; yet it need not be so. Everything would depend on the ages of the people living, and the migrations taking place amongst them. "The mean age at death can be employed with safety as a true test only in those (1) cases in which, the calculation purporting to embrace an entire class of persons, every member of that class is included; or (2), in which, the calculations embracing only a section of an entire class, the class in question is retained in a state of perfect uniformity during the whole time comprised in the calculation." (Dr. Guy).

To fulfil these conditions it would be requisite to take, say 100,000 children born in a given year, and trace them through life till they were all dead; or, to secure a population which has continued stationary (has gained as many by fresh births as it has lost by deaths) during the time over which the calculations extend. It will readily be seen, therefore, that the mean age at death could not be safely or practically used at present* as a measure of sanitary conditions amongst the restless millions of our town and country populations. Change is the rule of our modern civilisation, and it is impossible to ascertain the numbers living at different ages, except at the period of the census; one town attracts the young, another holds out inducements to the aged or the invalid; peoples differ also in stamina and vital force. London, for instance, is crowded with young immigrants from the country; 40 per cent. are under twenty years of age, yet the mean age at death is 29; the mean age at death for the county of Hereford is 38½,—an apparent difference of 9½ years of life in favour of Hereford. But transfer the population of London to Hereford, and the mean age at death would be 30½; or, an advantage in a sanitary point of view, of a year and a half only, instead of the larger term deduced from the mean age at death, without this very necessary correction. Dismissing, then, the "mean age at death" as an unsafe index of vital conditions, save under very exceptional circumstances, let us pass on to—

II.—*The Expectation of Life*, or "the mean number of years which, at any given age, the members of a community, taken one with another, may be expected to live." The name of Dr. Farr

* Dr. Rumsey, in a pamphlet on "The Value of Life Tables as Evidence of Sanitary Condition," proposes to trace each life from its commencement to its conclusion, by the addition of the birth place to every registry of death. If it were feasible thus to connect the registry of birth with that of the death, the mean death rate might supersede all other tests of the sanitary state and vital force of a people.

will always be identified with the three valuable life tables, which he has constructed with infinite care and industry for England. They are based on two concurrent series of observations—the numbers and ages of the living, and the numbers and ages of the dying; and if these could be ascertained with accuracy, the life table would comprise the information essential to a perfect numerical test of vitality; but we have already seen that the numbers and ages of the living must of necessity be uncertain in the ever-shifting population of our towns; and although "these oscillations of human life in different localities compensate each other to a great degree when the whole population of England is observed, they stand out in full force when the facts recorded in each district are made the basis of a separate calculation."*

It would seem, therefore, that the conclusions to be drawn from the expectation of life in districts and towns are vitiated, though to a less extent, by the same causes which have been shown to affect "the mean age at death" as an index of sanitary condition, and that neither can be accepted as a true test of vitality until a more frequent enumeration of the population, and more accurate particulars as to migration and place of birth shall have supplied the data, which are still wanting, to render the statistical system complete.

III.—*The rate of mortality*, or, as it is otherwise stated, "the number of living out of which one will die annually," has purposely been left to the last, as being the most used, and, consequently, the most important for the present of the three tests which it was proposed to examine.

E. T. WILSON, M.B.

[TO BE CONTINUED.]

A BILL OF FARE for the Wax Chandlers' Company, Oct. 29, 1478, being Lord Mayor's Day, in the Reign of King Edward IV.—A loin of beef, 4*d.*; a leg of mutton, 2½*d.*; two loins of veal, and 2 ditto of mutton, 1*s.* 4*d.*; a goose, 6*d.*; a capon, 6*d.*; a pig and a rabbit, 6*d.*; a dozen of pigeons, 7*d.*; a hundred of eggs, 8½*d.*; a gallon of wine, 8*d.*; a kilderkin of ale, 1*s.* 8*d.*; Total, 7*s.*

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* Dr. Rumsey, *loc. cit.*

FRENCH POULTRY.

The annual exhibition of fat animals, poultry alive and prepared for market, seeds, grain, and agricultural implements, took place in Paris last month, and no Englishman who visited it could fail to be struck with the great attention paid to the rearing, feeding, and preparing poultry for sale. France in past years was not famous for either beef, mutton, or pork; good fish was difficult to procure in Paris and other places far from the sea; and, consequently, farmers turned their thoughts to poultry, which is a much more common article of food in France than with us, partly perhaps on account of climate, and partly as the result of study and practice, which have produced the best races of poultry by economical methods. Including pigeons and rabbits, there were no less than 700 lots of live poultry at the exhibition, the males being shown singly, and the females by twos, threes, and fours; amongst the most remarkable were the black, tufted Crèvecœur, the Houdan, La Flèche, Maas, and Bresse fowls, and the turkeys. The lots of dead poultry, two birds in each, amounted to 400, each kind being prepared for market in the usual way. In the case of the choicer sorts, the care bestowed in the rearing showed itself in a remarkable manner; the wing bones were curious, from their smallness, while the amount of flesh was in inverse proportion, and the general appearance of the skin delicate and smooth; in some cases the appearance was improved by wrapping the fowls in cloths dipped in milk, but this refinement may be set down amongst the fancies, or, as our neighbours would say, the *coquetteries* of a special market.

Fowls are sent to market in France in three conditions—ordinary, half fatted, and fully fatted. The fattening is carried on in a very systematic manner, the cramming being performed by hand, as with us, and the food being composed of mixed meal—Indian corn, barley, etc. In some cases the fowls are kept on perches, to which they are fastened by the leg, and which are supported by a central iron stem, the whole turning easily on its centre, so as to save as much time as possible to the feeders. The importance of the poultry rearers' business may be indicated by the high prices which fattened capons and pullets fetch in the markets. In the quotations at the

Halles centrales, the great market of Paris, we find the following:—Fowls, common, from 1f. 20c. to 3f. 52c.; ditto, ordinary, from 2f. to 4f.; ditto, fat, from 3f. 50c. to 6f.; fat capons, 5f. to 7f.; ducks, 1f. 80c. to 3f. 25c.; ditto, fat, from 3f. 50c. to 5f.; turkeys, ordinary, 4f. to 7f. 25c.; ditto, fat, from 8f. to 12f. 50c.; geese, ordinary, 3f. to 5f. 75c.; ditto, fat, from 6f. to 8f. One positive proof, however, is worth a dozen general assertions. A poultry show took place the other day at Louhans, in La Bresse, famous for its fowls, when 400f. in money, and a large number of silver and bronze medals, were awarded, the Minister of Agriculture presenting the society with 300f. and ten medals. The capons that won the prizes averaged nearly 9 lbs. each in weight, and the pullets 5½ lbs.,—the prices being 12f. and 7f. respectively. Extra fine fatted capons often sell for 12f. to 15f. In our opinion the very fat fowls of France are inferior in delicacy to the half fatted; the actual appearance of fat in fowls detracts in our estimation from the delicacy of the food, but this is only a matter of taste. The essential point is, that the breeding of poultry is carried on so as to serve all tastes, and create a very large demand, and a business of considerable importance; while, better still, the production of this expensive poultry causes an improvement both of the race and of the methods of rearing and feeding, so that the middle and lower classes have a positive interest in the subject. This attention to poultry breeding also gives rise to an abundant supply of eggs, and a very large export trade.

Amongst the curiosities of poultry breeding may be mentioned the adoption, in several parts of France, of perambulating fowl-houses; these are constructed like omnibuses, the interior being fitted up as a fowl-house, and taken on to ploughed or other land where there is a plentiful supply of insects; thus the fowls obtain food which they enjoy, and the farmer has the aid of valuable assistants without charge. With a little care during the first day or two, the fowls become quite accustomed to their travelling home.

G. W. YAPP.

THE cultivation of the tea plant promises to become a source of wealth to California. The tea plants, which already number 300,000, are doing well. One of the clearest burning oils—China oil—is extracted from the tea nut, and enhances the profits of tea culture. The Chinese and Japanese immigrants will supply suitable labour for the new plantations.

POPULAR FOOD ANALYSIS.

No. 4.—COCOA.

There is probably no article of diet with regard to the origin of which there is so much confusion in the popular mind as that forming the subject of our present article. Cocoa nuts and cocoa nibs, cocoa nut milk and cocoa oil, are all believed to be derived from one common source. This confusion arises principally from the circumstance, that the name of the substance which we use as a beverage should really be spelt *cacao*, and is as totally distinct a term, when so written, from cocoa, as the two plants thus confused are from each other. The cocoa nuts, so greedily devoured in our childhood, *au naturel* or in the form of cocoa nut rock, and which, in adolescence, we knock off sticks on the Derby day, when the champagne has developed our destructive propensities, are the produce of the cocoa palm, or *cocos nucifera*; while, on the other hand, the cocoa which we boil for breakfast is the seed of the *cacao theobroma*, a dwarfish, although pretty tree, and very different from the gigantic palm already mentioned. The *cacao theobroma* is found chiefly in South America and in the West Indies, but is also cultivated to some extent in the Isle of France, its principal commercial varieties being those of Trinidad, Guayaquil and Bahia. It bears a fruit not unlike a melon, in the soft rose coloured substance of which the cocoa seeds are embedded. The seeds themselves are about the size of a large almond, but somewhat thicker, and not so regular in shape. Those from the two first-mentioned districts are covered with a brown and bitter husk, enclosing a somewhat pasty and deep-coloured mass, which constitutes the useful portion; while the seeds from Bahia, on the other hand, are smaller, lighter in colour, and have in the interior a tinge of greenish brown. The number of seeds in the cacao fruit varies according to the districts in which the tree is cultivated. When ripe, the fruit changes from green to yellow, and it is then gathered and opened; and the seeds, having been taken out, are dried in the sun, or are subjected to a slight fermentation, by burying them in the earth, before being dried.

Cocoa is manufactured for domestic use in various ways:—1. The seeds are very gently roasted till the flavour is well brought out, and, after being winnowed from the husks, are broken into little pieces. In this form they are known as cocoa nibs. 2. The seeds, having been roasted, are ground between hot rollers into a paste, and, after due admixture with starch and sugar, the paste is either desiccated and reduced to powder,—in which case it is called

"soluble," "homœopathic," "digestive," or any other attractive name—or it is dried in masses, forming flake and rock cocoas. 3. The roasted and winnowed seeds are ground to paste, sugar and seasonings added, and cast into moulds, in which form they are called chocolate. Dr. Johnston states that the separated husks are largely imported into this country under the name of "miserable," and used for adulterating common cocoas, to form a cheap and agreeable beverage for the poorer classes! The composition of cocoa is shown by the following analysis by Mitscherlich:—

Theobromine	1·20
Cacao Red	3·50
Cacao Butter	49·00
Gluten	15·00
Starch	16·00
Sugar	0·60
Cellulose	5·60
Ash	3·50
Moisture	5·60
	100·00

It will be noticed that cocoa possesses, like tea and coffee, an active nitrogenous principle called *theobromine*. This principle resembles theine or caffeine, inasmuch as it is also white, crystalline and bitter; but it contains more nitrogen even than these substances, and is consequently more active. All that has been said about the sustaining and other properties of caffeine, in our coffee article, may be considered as applying also to *theobromine*. Cocoa likewise contains a volatile oil, similar to that of coffee; but it differs from the latter substance in possessing in a high degree fat and gluten, both of which tend to increase its nourishing properties. The fat, commonly called cocoa butter, may be extracted from the seeds by reducing them to a pulp, and squeezing them between two heated metallic plates, when the fat melts and is pressed out. It is of the consistence of suet, white and semi-transparent, and melts at 30° centigrade. It is principally stearin with a little olein, and has a peculiarly agreeable taste and odour.

From all this it is evident that cocoa is an exceedingly nourishing, but, at the same time, a very rich article of food. Dr. Johnston, with good reason, compares it to milk, as follows:—

	Cocoa.	Milk (dried).
Fat or butter	51	24
Casein or gluten	21	35
Sugar or starch	22	37
Ash	4	4
Theobromine	2	0
	100	100

But cocoa being richer in fat than milk, and, consequently, more indigestible, some sanitary authorities are prepared to approve of its dilution, by means of starch and other such substances. This is, however, sometimes pushed to an extreme

extent, and Dr. Normandy says: "Unfortunately, however, many of the preparations of the cocoa nut sold under the names of chocolate, of cocoa flakes, and of chocolate powder, consist of a most disgusting mixture of bad or musty cocoa nuts, with their shells, coarse sugar of the very lowest quality, ground with potato starch, old sea biscuits, coarse branny flour, animal fat (generally tallow, or even greaves). I have known cocoa powder made of potato starch, moistened with a decoction of cocoa nut shells, and sweetened with treacle; and chocolate made of the same materials, with the additions of tallow and ochre. I have also met with chocolate in which brick-dust or red ochre had been introduced to the extent of 12 per cent.; another sample contained 22 per cent. of peroxide of iron, the rest being starch, cocoa nuts with their shells, and tallow. Messrs. Jules Garnier and Harel assert that cinnabar and red lead have been found in certain samples of chocolate, and that serious accidents had been caused by that diabolical adulteration. Genuine chocolate is of a dark brown colour; that which has been adulterated is generally redder, though this brighter hue is sometimes given to excellent chocolate, especially in Spain, by means of a little annato. This addition is unobjectionable provided the annato is pure, which, however, is not always the case." Out of sixty-eight samples examined by the *Lancet* commission, thirty-nine were found to contain ferruginous earths.

Let us see how far this dreadful programme is in reality carried out now-a-days, by glancing at the following results of our analysis. But before doing so, we will explain the simple process we have adopted for obtaining our results. The mode of procedure does not pretend to absolute accuracy to a fraction, but will be found in practice easily performed and understood. It is as follows:—

1.—Twenty grains of the cocoa are weighed out and dried for some hours at a steam heat. The dry cocoa is then weighed, and the loss of weight, multiplied by 5, gives the moisture.

2.—The residue (from 1) is digested for two hours, with frequent agitation, in four ounces of ether, and the latter having been poured off as closely as possible, the cocoa is again dried, weighed, and the loss of weight ascertained and calculated as above. The loss equals fatty matters.

3.—The residue (from 2) is digested for six hours in ten ounces of cold water, and again dried and weighed as before. This loss represents sugar, theobromine, and other soluble constituents; and it is evident that, if sugar of adulteration be present, the loss of weight will be greatly increased.

4.—The residue (from 3) is boiled for an hour in ten ounces of water, to which half an ounce of hydrochloric acid has been added,

and once more dried and weighed. The loss in this case consists of starch, cocoa red, etc., and here the starch which has been purposely added is discovered.

5.—A few grains of the cocoa are burned on a crucible lid, and the colour of the ash is observed. If this be decidedly red, then ochre or some such colouring matter has been employed.

As we have already remarked, although the process cannot pretend to absolute truth, yet a very close approximation can be thus obtained, especially if samples of pure cocoa be first treated in an exactly similar manner. This we have done, and the following results represent an average of several such experiments:—

Moisture	4·5
Soluble in ether (fat)	48·5
Soluble in water (sugar, etc.)	11·8
Soluble in acid (starch, etc.)	18·8
Residue insoluble (cellulose, etc.)	16·4
	100·0

The colour of the ash was a light grey, and no foreign starch was visible under the microscope. With this explanation we proceed to the

Analysis of Thirty-one Samples of Cocoa.

No.	Moisture.	Soluble in Ether (Fat).	Soluble in Cold Water (Sugar, &c.)	Soluble in Acid (Starch, &c.)	Insoluble (Cellulose, &c.)	Colour of Ash.	Nature of chief Foreign Starch, by Microscope.
1	4·6	53·2	20·5	15·0	6·7	Grey.	None.
2	3·2	53·6	9·7	22·6	10·6	,,	,,
3	4·2	46·9	22·7	14·2	11·8	,,	A little Arrowroot
4	3·4	40·5	18·6	28·0	9·3	,,	,, ,,
5	5·4	26·2	34·5	24·8	9·0	,,	Sago.
6	6·4	20·0	38·6	29·0	5·9	,,	,,
8	4·8	24·9	38·5	20·4	11·0	,,	Arrowroot.
9	5·6	34·0	20·0	23·6	18·0	,,	Sago.
10	4·5	26·6	33·3	28·6	6·8	,,	Arrowroot (large)
11	4·1	31·5	16·6	25·7	22·0	,,	None.
12	5·6	32·4	20·3	20·9	20·8	,,	Almost none.
14	11·2	20·6	47·0	10·0	10·9	,,	None.
15	4·5	27·1	35·2	25·9	7·2	,,	Arrowroot.
16	5·0	21·0	38·0	30·0	6·0	,,	,,
17	4·8	29·4	28·9	28·9	7·9	,,	,,
18	6·0	20·2	42·3	24·8	6·6	Red.	,,
19	5·7	17·4	68·4	1·9	6·4	,,	,,
20	9·5	8·0	39·5	39·5	4·0	,,	Sago.
21	5·1	48·2	11·8	18·0	16·7	Grey.	None.
22	7·1	11·6	38·8	37·4	5·1	,,	Sago.
23	10·4	11·9	26·2	42·1	9·2	,,	,,
24	7·0	14·7	33·4	39·5	5·3	,,	,,
25	6·1	13·9	38·9	34·2	6·6	,,	,,
26	6·2	14·9	44·6	28·2	5·9	,,	,,
27	4·8	16·8	44·3	20·8	13·3	,,	,,
28	5·0	16·8	41·3	29·8	6·6	,,	Arrowroot.
29	7·5	11·2	36·0	41·0	4·9	,,	,,
30	5·9	16·2	41·0	30·0	6·8	,,	Sago.
32	4·0	12·7	24·7	54·5	4·0	,,	Arrowroot.
33	10·4	14·6	22·0	48·4	4·6	Red.	Sago.
34	5·0	43·2	10·8	20·0	21·0	Grey.	None.

It will thus be seen that, out of all the samples examined, the only one which answers to the analysis of pure decorticated cocoa is No. 21. Nos. 2 and 34 are, however, also good samples of cocoa, while Nos. 11 and 12 must be noted as specimens of pure cocoa deprived of its oil. No. 1 is a pure cocoa to which desiccated milk has been added, thereby slightly increasing the fat and sugar. The worst of all are Nos. 18, 19, 20, and 33, in which not only is the quantity of real cocoa reduced to a minimum, but ochre or some such ferruginous earth has been added for colouring. On the whole, the picture is one not calculated to reassure the cocoa-consuming portion of the public. We append recipes for the manufacture of cocoas which would be similar to three of the most adulterated samples.

Cocoa	100 lbs.	100 lbs.	100 lbs.
Sugar	40 lbs.	36 lbs.	37 lbs.
Starch	15 lbs.	30 lbs.	30 lbs.
Water	—	6 pints	7 pints
Ochre, or some such earth ..	—	a little	a little

The addition of water would be unnecessary if nice damp raw sugar were used in slightly increased quantity. By following these receipts, our readers who like "soft tasting cocoa" (as we heard a lady call her favourite manufacture the other day) can make their own composition much more cheaply than they can buy a packet of the "genuine" article they use at present.

Now we are brought face to face with the question: Ought this addition of starch and sugar to cocoa to be regarded as an adulteration? If, on the one hand, we take the word adulteration to mean the mixing of anything hurtful or deleterious with an article of food, the answer must be in the negative, because not only is the starch harmless, but it supplies a want in the article itself, besides diluting its rich and somewhat dyspeptic qualities. Indeed, this admixture has been regarded by an eminent food authority, as "a skilful chemical adjustment, made without chemical knowledge, as the result of long and wide experience." But, on the other hand, if we take adulteration to mean the mixing of anything (even if it should be beneficial) with an article of diet, without distinctly setting forth the fact, the present style of cocoa manufacture becomes a sophistication. With the greatest desire to let this matter down gently, as we have no wish to hold almost all the cocoa manufacturers in England up to public reprobation as sophisticators, we cannot escape the fact that many *prepared* cocoas are advertised as "genuine," nor can we help harbouring a shrewd doubt, that the comparative prices of cocoa and starch had much more to do with the "skilful chemical adjustment," than a real desire to benefit the

public. We should advise the many respectable firms engaged in the cocoa trade to call their cocoas plainly and distinctly *prepared cocoas*, or by some such term as would convey the true impression of their nature. This would be very much more sensible than denominating them "genuine," "soluble," or "homœopathic," etc., when all the connection they have with solubility simply consists in the amount of soluble matter added as a diluent, and with homœopathy in the small amount of real cocoa which they give at a dose. In a word, we are once more brought back to the necessity for an "Adulterations Act," such as we have all along steadily advocated, namely, a law to compel everything to be sold under its own name, with proper officers to see the Act carried out; but to hope for such a thing under the present *regime*, seems almost Utopian; and we have no resource but to follow the dictum of an eminent statesman, and to "agitate and agitate."

In our next article we will conclude the subject by giving directions, illustrated by engravings, for the detection of adulterations of cocoa, by means of the microscope.

J. MUTER, Ph.D.

[Whilst regretting the generally unsatisfactory disclosures resulting from the cocoa analyses (several of the samples for which were specially sent by some of the most reputed manufacturers, and others purchased, bearing their names), we shall be willing, in justice to those makers whose articles are pure, to repeat in our next number, if so desired, any of the preceding analyses with the names appended.—ED.]

THE Woolhope Naturalists' Club, which has its head quarters at Hereford, is doing, amongst other valuable scientific work, real good to the country, by investigating the edible fungi of Herefordshire and the neighbouring counties. An annual dinner is held at the proper season, when every possible variety of fungus is experimented on, from the fungus pure and simple to the fungus hashed, curried, or dressed with sauce *à l'agaricus*. Each member is bound by the oath of the club to taste every specimen; and it is a point of honour with them that, whatever untoward consequences may have arisen from too incautious feeding on *fistularia hepatica*, they must endure their indisposition with Spartan fortitude. At a recent meeting at Hereford, four new specimens were recorded, one of which, discovered by Dr. Bull, was entirely new to Britain. Although harmless, the new arrivals are no great acquisitions to the fungus cookery book, being exceedingly woody in taste. We hope, at the proper time of year, to recur more fully to this subject.

MR. TWINING'S MUSEUM AT TWICKENHAM.

PART I.

A VERY few minutes' walk northwards from the railway station at Twickenham brings us to the gates of a resident gentleman (Mr. Thomas Twining), who has erected inside his grounds one of the most widely useful and beneficial of truly charitable buildings, though not eleemosynary in character, viz., a Museum of Domestic and Sanitary Economy. By those who take an interest in the well-being of our working poor, no time can be better spent than an afternoon in this Museum, which is the result of many years devoted, by a philanthropic gentleman, towards a practical solution of the important question, "How to ensure to the working-man a healthy and comfortable home."

This design, it appears, has been for more than thirty years in the mind of Mr. Twining, who thought that he saw his way, as an active member of the Labourers' Friend Society, to establish in various towns such economical museums as that which we see at Twickenham, but of which at present there are no imitations elsewhere, except at South Kensington, and at Brighton, where Mr. Nourse has reproduced Mr. Twining's idea. In a certain sense, however, the idea first took shape and form in one of the departments of the Universal Exposition of 1855, at Paris. It was a collection of every possible description of household treasures; in short, of all material things needful to man. It included "marvels of cheapness," ingenious devices for the economy of space, and specimens of food and clothing. The visitors called it "the exhibition of cheapness;" yet, as the *Examiner* remarks, "It was something more than that—it was an exhibition of prudence, of forethought, of cleanliness, and of sanitary arrangement, which together form the foundation of domestic economy." But we must hasten to the Museum itself.

We knock at what looks like the vestry-door of a temporary church, and are admitted by the curator of the Museum and his assistant. We are in the ante-room of the building itself; and this ante-chamber serves the purpose of a library. Its shelves, on all sides, are devoted to books on social science in its various forms; reports of societies in town and country which are engaged in working out the problem of "how to live;" works of reference on social

and economic subjects; reports of exhibitions at home and abroad; scientific text-books; works on domestic medicine and popular education; the transactions of the Social Science Association; works on economic architecture; together with an elaborate collection of pamphlets on kindred subjects, all carefully arranged and classified. Having examined these, we pass on into the building itself. It is about 80 ft. long by 30 ft. broad, and is divided, by partitions which reach nearly to the ceiling, into what would be called in a church four distinct aisles, but which we suppose we had better call four longitudinal passage ways, each devoted to an exhibition of specimens of articles in one or more of the eight or nine departments into which the Museum is subdivided. On our right and left are table spaces, divided into boxes and partitions, the screens or walls of which are hung with maps, models, diagrams, and pictures. Some articles, for which otherwise there would not be room, are suspended from the ceiling by pulleys, and can be lowered for minute inspection. So thoroughly is even space here utilised and economised.

The First Section, or department, is that of building designs. It exhibits a collection of "homes for the people" in various times and countries, with striking contrasts between the "fever dens" of Drury Lane or Whitechapel and the Peabody Buildings, etc.; with illustrations on the walls, and in well-sorted portfolios. We notice all sorts of designs and models, to scale, for healthy and comfortable homes in town and country; for instance, those lately erected at Lambeth, Chelsea, and Bloomsbury; *cités ouvrières*, such as that of Mulhouse, in France; model villages, like Redhill, Surrey; designs for establishments of all kinds for the benefit of the poor; and, finally, illustrations of the best construction in detail of the several parts of buildings.

The Second Section is devoted to materials for building, and furniture—including educational and commercial series of the chief varieties of stone, sand, mortar, and cements; artificial stone; bricks and tiles; paving and roofing materials; wood of various kinds for building, furniture, etc., with botanical illustrations; processes for preserving and rendering fire-proof; varieties of window glass, and other manufactures; materials and appliances for house-painting, white-washing, staining, paper-hanging, and other decorative purposes. This is closely connected with Section 3, which is even more distinctively educational in its character, showing us a series of the metals in various styles, from the ore to the prepared state; metallic alloys; building ironmongery, including fastenings of every description, and a priced

series of articles required for a model dwelling. Then come all sorts of appliances for the supply of water, such as filters, etc.; appliances for warming, cooking, etc., on a small scale; larger and more cumbersome articles, such as grates, stoves, etc., are relegated to another part of the building, where they may be more conveniently displayed. Next come select examples of household ware and furniture, showing the various ways in which things are made in this country and abroad, and their relative advantages; articles supplied by the furnishing ironmonger and cutler, the gas-fitter and lampmaker, the earthenware, china and glass dealer, the turner and brushmaker, or the upholsterer, etc.

We pass on to Section 4, and find a perfect *embarras de richesse* in the specimens of textile materials, fabrics, and costumes, which lie before us, each with corresponding illustrations. Here we see examples of dyeing; materials as produced, and in various stages of preparation for the loom; matting, drugget, carpets, and the like; textile fabrics of all kinds for household purposes, and for apparel; trimmings, and other accessories of dress. Here are priced lists of outfits, suited to the various requirements of the working classes; select articles of hosiery, ready-made clothing, and coverings of every description, for men, women and children, with illustrations of the manufacture of waterproof articles, hats, shoes, clothing for infants,—a branch of special interest to the ladies,—and finally á variety of specimens, models, and prints of the costumes adopted in different parts of the world, from the North Pole to the Equator, and "from China to Peru."

We pass on next to Sections 5 and 6, which more especially concern ourselves, as being devoted to food, fuel, household stores, and to what may be called, even here, *par excellence*, the Sanitary Department. This part of the Museum also is richly illustrated by diagrams, cards, etc., upon the walls. Passing by a series of practical illustrations of what we may call the "philosophy of nutrition," we come to the proximate constituents of food, showing good and bad dietaries, specimens of unwholesome food, such as the poisonous pork of which we have heard so much of late years; examples of adulterations, and of the means and plans of preserving food; then, passing into the higher region of culinary science, we come to the auxiliaries of water, salt, and the food supplied by the animal and the vegetable kingdom. Under the former, this department gives us specimens of all kinds of birds, fish, shell-fish, eggs, and milk; and under the latter, all kinds of cereals, leguminous seeds, or pulse, roots and bulbs, vegetables of which the stalk, leaves, or top are chiefly eaten; fruits and

flowerless plants; food for the fattening of live stock; secreted and extracted products; biscuits, cakes and confectionery; condiments; and, finally, narcotics of different kinds. These are followed by examples of cocoa, coffee, tea, snuff, pickles, oils, tobacco, and their substitutes; fermented and distilled liquors, showing the composition of beers and wines, supplemented by specimens of other refreshing beverages. Then come examples of fuel of all kinds; materials for ignition; and stores for the everyday occupations of washing, cleaning, sweeping and scouring.

Next we notice, on the walls and in portfolios, well arranged diagrams and plans of the means of protecting our dwellings against inundations, for our water-supply and sewerage, and for the improvement of unhealthy districts. Next come all sorts of patented appliances for the ventilation of our dwellings, for preventing the inconveniences arising from damp, smoky chimneys, and unhealthy effluvia. Here we have specimens of disinfectants, and appliances for hygienic exercises; baths, and other means for producing a healthy condition of the skin. Then come some useful practical lessons in what we may call the hygiene of dress, —nursery appliances, orthopœdic apparatus, crutches, and artificial limbs; means for the relief of deafness, blindness, and weak eyes; reading maps and other occupations for the blind, and specimens of their work; appliances for a sick chamber and household remedies; means of comfort for the afflicted, such as crutches and invalid carriages. Then follows what Mr. Twining justly calls an "educational series" of drugs commonly used in well ordered houses, with botanical and other illustrations. Here we see arranged before us every conceivable kind of medicinal herb, including narcotics, sudorifics, etc.; popular patent medicines, with their several compositions; drug adulterations; injurious articles likely to be mistaken for medical, or at all events for wholesome substances; antidotes and modes of treatment for poisons, whether swallowed or absorbed into the system. The walls above us are richly covered with prints of poisonous plants, especially among the fungi, venomous reptiles and insects, noxious fish and mollusca, and animals in a rabid state. To these follow very naturally examples of means of safety from, and the destruction of, beasts of prey, of house and field vermin,—matters most important to the rural cottager at home, and to the colonist abroad. Lastly come specimens of various protectives from the effects of excessive heat or cold, from asphyxia, drowning, shipwreck (including models of poles and rope drags), lightning, fire, accidents and discomforts in travelling by railway, and accidents to which

children are peculiarly liable; and of the means of preventing those injuries and diseases which are specially incident to various industrial occupations, such as steel-grinders, knife-makers, etc.,* where the process of manufacture itself is injurious.

We have travelled on so rapidly, that we really have left ourselves no space to describe the remaining sections of this Museum, devoted to the home education of children and adults, including toys, arts of design, and cottage decoration; or the scarcely less interesting department given up to household requisites, toilet articles, garden and field implements, seeds for agricultural and horticultural purposes, and contrivances for lightening and economising labour. We will only say that in this "Miscellaneous Department" the visitor will find, ready to his hand, all sorts of samples and models of museum fittings and appliances, with estimates to guide him, in case he wishes to form an economic collection for his own neighbourhood on a large or small scale. Appended to this section is a well chosen economic library, comprising books, pamphlets and documents (British and Foreign), selected and arranged for convenience of reference in matters of domestic, sanitary, educational, and social economy, and practical benevolence, especially intended for the use of persons engaged in the organisation of provident and charitable institutions, and of clergymen, medical men, schoolmasters, and others entrusted with the bodily welfare or intellectual guidance of the people.

E. Walford, M.A.

[to be continued.]

The following note of Kaffir cookery is from Hamilton's "Life and Sport in South Africa":—"First of all I immersed the fowls in scalding water, and by this means I was enabled to strip the skin and feathers off together. I then went to an ant-heap, which was readily found, for there were many in the neighbourhood, and made a hole in it on a level with the ground, into which I put some sticks and a bit of fire. This soon made it almost red hot and quite hard. I then knocked off the top and placed the fowls on it, covered them over with a little loose mould, and in a very short time they were ready for eating. This impromptu meal was most heartily partaken of, and even more eaten than if it had been cooked in European fashion."

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* This important subject was brought under the notice of the Society of Arts, by Mr. Twining, in 1854, under the name of Industrial Pathology. It is now receiving the serious attention of the Board of Health.

FISH BREEDING AND FATTENING IN CHINA.

THE fineness and abundance of the fish in the rivers, lakes, and ponds of China, have often been noticed, and it is well known that great ingenuity and care are taken to keep up the supply by artificial breeding and other means. These modes differ according to climate and other circumstances; generally, a spot is selected where a pond or lake is shaded by trees of certain kinds, so that the water is maintained at a pretty regular and low temperature for the breeding of fish. A shallow artificial lake, or reservoir, or more frequently two such, with canals connecting them together, being prepared, the sides are puddled with clay, and around are planted the kind of trees, beneath the shade of which carp and trout love to dwell. A number of fish are netted in a river or lake, and the finest milters and spawners are selected (the latter in greater proportion than the former), and placed in the reservoirs already mentioned. The fish receive daily food, composed of certain herbaceous (probably water) plants, while small balls, composed of clay and manure, are also thrown into the water. The water of the reservoirs is frequently changed, the fish being driven into the adjoining reservoir, if there be two, or otherwise collected in tubs or tanks until the fresh water is introduced.

One thing considered essential is the exclusion of the rays of the sun from the reservoirs, and the marsh willow is one of the trees largely employed for the purpose. These trees are planted thickly around the pools, and the fish is not introduced until the branches of the trees are well developed and leafy, so that there is little danger of their dying. There is also another method in very general use for obtaining fine fish; about the month of March, small fish are caught in the rivers or lakes, and kept in the nets plunged in water until they have reached the desired size, when they are placed in pails, which are carried in the usual way on the two ends of a bamboo placed across a man's shoulder, sometimes to great distances. For the fattening of fish, the males and females are often placed in separate tanks, and fed with potatoes, boiled peas, bread, decayed roots, horse dung, and many other kinds of refuse. Some of these methods are not very intelligible; but the fact is beyond doubt, that the Chinese have studied and practised fish culture for ages, and that their rivers, lakes, and pools swarm with fish.

G. W. Y.

LONDON DINNERS.

PART II.

In classifying roughly the various dining-rooms west of Temple Bar, we found that they divided themselves into those which offered a choice of dishes at a price per dish, and those which offered dinners *à prix fixe*, the two methods being sometimes combined. The second class commences with dinner off the joint, and ascends to more elaborate repasts, including soup, fish, etc. These latter are rather perplexing from the bewildering differences of price, and one comes perforce to the conclusion, either that some proprietors must be actuated by benevolence—which is its own reward—or that others must reap enormous profits. Viewed from the standpoint of the diner-out, we prefer the *juste milieu;* we have an instinctive dread of "Dinner for 1*s.*" on the one hand, and on the other we do not care to expend a disproportionate sum on our daily meal. In our (not always successful) search after our desideratum, we have had frequent occasion to concur strongly in the truth of a profound remark made by the editor of a leading weekly, that "London dining-rooms need great improvement."

The existence of the restaurants attached to the public offices may perhaps account for the non-realisation of the idea, but we have wistfully asked ourselves, why is there not a co-operative dining-room? A short time ago, an advertisement appeared, inviting gentlemen to join a species of dining club, at a subscription of 10*s.* for a course of five dinners—including light wine. We learned that the parties concerned were German, and though we do not know how the plan succeeded, the idea is capable of development. Let us now detail the results of our month's experience, the acquisition of which has led us into strange, as well as familiar places.

We have not been unmindful of the existence of distinctive classes of early and late dining houses; though, in the western districts, the two characteristics are usually combined. The early diners, *i.e.* from 1 to 3 p.m., in some places possess an advantage—to us, apparent, rather than real—inasmuch as the same house will offer a sufficiency of meat, vegetables, and cheese for 1*s.* up to 3 or 4 p.m., after which hour, dinner off the joint is charged 1*s.* 6*d.* As an example, the Clarence, in Scotland Yard, a good type of its class,

offers a surprisingly good choice for 1*s.*, and has accordingly a numerous attendance about 2 p.m. We cannot say much in praise of the later dinner off the joint, which is far below Carr's for the same money, customers being apparently too few at the vesper hour to reward enterprise. We ourselves are not given to experiments in the way of early dinners, and prefer to lunch on the excellent cold viands at that best of luncheon houses, Lucas's, in Parliament Street; varying it with the Westminster Palace Hotel Restaurant, which is good and cheap, or the comfortable Gaiety, with its luncheon at 1*s.* 6*d.* The meridional class of diners have a considerable choice. The reader may remember our description, in the last number of the Journal, of the "Windsor" Sunday *table d'hôte*, which he may try on week days at 2 p.m. Wyatt's, in the Strand, east of the Field Office, is, we imagine, an afternoon house, for despite the promises of the bills of fare which, like food auction bills, disfigure the front, our experience at a later dinner hour found it decidedly wanting. Our observations on this head made us acquainted with the advantages possessed by Covent Garden, not as some may think, in the Tavistock, of well-deserved repute, but in the ordinary of a humble hostelry—the King's Head, in James Street; it is only "a public," but the landlord, trained in good city schools of feeding, by due discrimination in the quality and cooking of his viands, draws to his board the incongruous classes from the garden of herbs, and the garden of song—the growers of acres of strawberries and valleys of violets, and the purveyors of tons of raspberries, who jostle and fraternise with the followers of Costa; and we must say that, whether it is due to the æsthetic power of the horticultural or operatic element, the meats and liquors are such as put to shame many a dining house of more exalted pretensions. We cannot delay to particularise more of the "early" dining houses; the selection must, in all cases, be limited by the vicinage. When the day is done, we have time to wander to our pet place; but the early dinner or luncheon must be taken close at hand. We have mentioned the last instance, more because it shows, *crede experto*, what can be done by good management in the way of combination of good quality, with a profitable business. *Ce va sans dire*, say you; then why don't we always get it?

Let us pass from the earlier to the later, and glance at the restaurants at Charing Cross and Victoria. Regarded as dining rooms, they are both early and late, though not confined to travellers only. Charing Cross, at least, offers a good, but highly priced carte, the joint dinner at 2*s.* being neither as good nor as

well served as it ought to be. We should fancy that only casuals, train-bound at that station, patronise it; and it does not compare well with Victoria, where Fisher's on the right, and Spiers and Pond's on the left, as you enter, offer the only oases in that railroad wilderness. In this respect, that ugliest and dreariest of railway stations is so far fortunate. Observation has taught us that a large number of habitués resort to Fisher's, and with some reason, for anyone living within reach must find it a good place to dine. Fisher's system is *à la carte*, his viands excellent and moderate, and he has fair and low priced light wines. Spiers and Pond range, we think, higher, but give a good joint dinner for 2*s.*; the traditional dearness of railway restaurants, so cherished by the Great Northern, still prevails to a certain extent, affecting even Fisher's; but the service and waiting in both are good. Railway restaurants scarcely, as a class, come within our scope, as ordinary hospices for diners out, but in this case they are used by the class for which we write, and some may thankfully remember this, if they find themselves about six o'clock in that otherwise dinnerless district.

From the Alhambra (the home of the ballet in London), round the east and north of Leicester Square, on to Regent Circus, there is an *embarras de richesse* in the way of places to dine. We have already, as the readers of the "Food Journal" know, tested the capabilities of the Globe and Solferino. In the square, where that unhappy torso rests, helplessly unhorsed, against his broken-backed steed, the Hotel Cavour, Vargue's Restaurant, and a mysterious Avernus called "The Shades," offer a gamut or descent of dinners, while at the corner of Princes Street the Cremorne culminates in pretentious show and charge.

Vargue's resembled too much the Globe, *et hoc genus omne*, so that, thanks to the pusillanimity of my companion, we did not dine there, but ventured on the experiment of a 2*s.* dinner at the Hotel Cavour. One might there get entangled in the carte. We tried the soup, rather watery; fish, eatable brill; an entrée, palatable but uncertain; rôti, so called, with French beans preserved in butter; a very good crème, and gruyère cheese, which made up the dinner given us for our money. We only wondered that the amiable and black-eyed hostess, and the active waiter, had so few guests to attend to. A bold-hearted friend joined us in the adventure; and we were both surprised that the room was not filled with the denizens of the French colonies of the Soho district.

The same *fidus Achates* accompanied us in a descent to the Shades. 1*s.* 6*d.* is advertised as the price of a dinner, comprising soup, fish, joint, and cheese. Down the steps we plunged; a

long passage led us into a spacious room, at one end of which presided the mistress, reminding us of Longfellow's description of the watchman's widow, whom the successor to the post was obliged to wed because she could not get out of the Tower. The passage led away into dark space, with a vista of empty tables, where some eighty people might have dined. Pea-soup, brill, roast veal, vegetables and cheese, very fair malt liquor,—a bold heart and good appetite found all these below the level of the sea of London life for 2*s*. Another long room served as a smoking room, and, in the distance, was heard the clink of billiards. We suppose that the underground dinner pays; though certainly it does not seem to be as popular as the underground railway. There was a gloom about the proceeding, and the banquet halls were deserted. One thing is certain, that if you, oh, hungry and economical reader! choose, you may obtain a dinner in this Avernus, which, in variety and quantity, will be well worth the money, and in quality will surpass many a one served on middle class English dining tables at a higher cost; and, again, we pause to ask, if a margin of profit be found thus, why are not our higher priced dinners better?

We spent double the money at the showy, pretentious Cremorne, and do not think we were, substantially, at all better served—*tout au contraire*. The table glittered certainly with glass and electro-plate, and various dishes figured on the carte, but the soup was very so-so, and it was a Hobson's choice of joints. There was roast beef alone, and that inferior in every way; while the cheese seemed Dutch, and the sherry was decidedly from Hamburgh. We were deterred by the experience of a week-day dinner from attempting the Sunday *table d'hôte* at 2*s*. 6*d*. per head. We incline to think that their *forte* is supper; and cautious diners had better pass by, —as we intend to do for the future. W.

[TO BE CONTINUED.]

FROM Queensland we have an interesting note upon honey, which in that colony, and indeed throughout Australia generally, forms an industry of considerable value. A centrifugal machine is used for extracting honey from the comb, the caps being first removed by a sharp knife, so that in less than a minute every particle of honey is taken out. The combs are then turned, and the cells on the other side treated in the same manner. The advantages claimed for this process are, that the larvæ, which are frequently very troublesome, remain in the comb, and that, when the latter is replaced in the hives, the bees readily use it over again.

PREPARATION OF POTATOES.

The following is given as a method of preparing an extract of the alimentary portions of the potato:—The potatoes, after being washed, are digested in water not hot enough to render the starch of a gelatinous consistency, but sufficiently so to soften the fibrous portions of the tuber, and allow of the solid alimentary portion being retracted with the water by mechanical pressure. This result, it is said, is produced in from six to ten hours by digestion in water heated to 104° to 140° Fahrenheit, the exact heat, as well as the duration of the digestion, depending upon the state of maturity, and the natural softness or hardness of the cellular tissue of the potato. In general, eight hours in water heated to about 120° is said to be sufficient for the purpose. When the digestion is completed, the potatoes are allowed to cool, or, what is better, are plunged into cold water; they are then reduced to such a condition that all but the cellular matter may be squeezed out without difficulty by means of any kind of press, the pressure being slight at first and gradually augmented; this second process occupies three, six, or even twelve hours, according to the degree of flexibility given to the tissues by the previous digestion and refrigeration.

The liquid thus obtained is boiled and condensed by evaporation until it assumes the consistency of Liebig's extract of meat, to which it bears considerable resemblance; like that preparation, it is almost incapable of decomposition in contact with air under an average temperature, and an ordinary amount of moisture, and consequently can be preserved with little difficulty.

A very interesting account of that strange looking Mexican amphibian, the Axolotl, has been contributed to the columns of the *Field* by Mr. Tegetmeier, in which he states that, in addition to the scientific interest attaching to the axolotl, it possesses an economic interest. In Mexico it is highly valued as an article of food. It sustains the rigour of the winter, and breeds readily in tanks. Mr. Tegetmeier promises to try them cooked, and report on their culinary merits. Axolotls at three for a shilling, as he suggests, would be a very startling novelty, and should be tested at the Blind Asylum. We shall anxiously wait the results of his expetiment.

The first of all products is certainly wheat, and it is a merciful thing that the article most in use, and the most wholesome of all, is also perhaps the most widely diffused. Wheat seems to grow everywhere; it abounds in Russia, it flourishes in Australia, it is the richest produce of France, it is grown in Asia and Africa; and, if China regards rice as her staple food, most countries would not readily exchange fine wheat flour for any other flour or grain in the world. The proportion of land cultivated with wheat in the different parts of the United Kingdom was, in 1869, as follows:—

	Area under all kinds of Crops. Acres.	Wheat.	Per Cent.
England	23,370,000	3,417,000	14
Wales	2,531,000	135,000	5
Scotland	4,438,000	136,000	3
Ireland	15,644,000	281,000	2
Great Britain	30,339,000	3,688,000	12
United Kingdom	46,100,000	3,981,000	8

England is therefore the only wheat-producing country of any extent in the United Kingdom. A marked distinction obtains in England between the grazing and corn districts. The wheat cropped land is principally found in the eastern counties; it is in smaller area in the south-midland and south-eastern counties, and smallest in the southern and north-western. Of greater importance, however, than the acreage under crop, is the quantity of produce obtained; and it is to be regretted that the agricultural returns give no indication whatever of the same, though the Irish statistics are in this respect complete. From experiments carefully made by Mr. Lawes, and related by him to the Royal Agricultural Society, as well as from observations and calculations made by Mr. Caird, who had large opportunities of testing the productive powers of the different counties, the average production may be estimated at 28 bushels per acre, which would give a total production of about 13,000,000 quarters. Compare this with the population, and we have the relative quantity per head as follows:—England, 4·63 bushels; Wales, 3·12 bushels; Ireland, 1·42 bushels; Scotland, 1·19 bushels. But let us calculate the quantity of bread obtainable from the home produce of wheat in the whole of Great Britain. If we deduct from the total quantity produced one-seventh for the seed, and take 5 quarters of wheat to make 7 sacks of flour of 280 lbs. each, the total production will be about 0·33 lb. of bread per day. It is well known, however, that the consumption of wheat is more than one quarter per head, or 1½ lb. per day; and thus a deficiency of nearly ½ lb. per day exists under any circumstances, which must be made up by importation from foreign countries. In truth, our

dependence on foreign corn has been growing of late very extensively, not from any diminished production at home, but from an absolute increase in the consumption of bread by all classes of society. In the reign of Henry VIII. the gentry had wheat for their table, but the poor used rye, barley, and oats. In the sixteenth and seventeenth centuries rye bread and oatmeal formed a considerable part of the diet of servants, even in great families; now, wheat flour has become the universal article of food in England. Considerable quantities of oats, rye, barley, beans, and peas, are also consumed for human food; but no estimate can be given, nor can we venture to say, how much of other vegetables, such as carrots, turnips, cabbage, etc., are annually consumed by the people.

There is one esculent, however, which deserves special mention, and that is the potato. First imported into Ireland by Sir Walter Raleigh, in 1623, it was only towards the end of the seventeenth century and the commencement of the eighteenth, that it began to be an important field crop, yet from that time, and ever since, it has become a most valuable auxiliary to wheat, as an article of food. Inconstant, indeed, it is, and subject to greater fluctuation than any cereal, but the production is comparatively easy and inexpensive, the cost of the seed is trifling, and the poorest farmer may cultivate potatoes enough for himself and his family. Hence a certain relation appears to exist between the state of material prosperity and the amount of dependence of any nation on the potato crop for human food, as may be seen from the fact that, in England, there are 66 persons to each acre of potatoes; in France there are 13, and in Ireland 5½. The extent to which the potato is cultivated in different parts of the United Kingdom will best appear from the following table:—

	Area under all Kinds of Crops. Acres.	Potatoes. Acres.	Per 100 Acres.
England	23,370,000	357,000	1·51
Wales	2,530,000	49,000	1·93
Scotland	4,438,000	179,000	4·03
Ireland	15,644,000	1,042,000	6·65
Great Britain	30,339,000	585,000	1·92
United Kingdom ..	46,100,000	1,635,000	3·54

And what may be the production? Taking the quantity sown in Great Britain at 585,000 acres, and assuming the production at 3 tons per acre, that will give a total of 1,775,000 tons, or 4,000 million lbs. But 4 lbs. of potatoes at least are required to give the nutriment of 1 lb. of wheat; therefore, if we take the fourth, that will be equivalent to 1,000 million lbs., or less than 0·12 lbs. of wheat

per head per day. In Ireland the proportion is much greater. There the quantity produced is estimated at 4,000,000 tons, or nearly 9,000 million lbs.; and, at the same proportion of four to one, that will give 2,250 million lbs. of wheat, or more than twice the quantity produced in Great Britain, with little more than one-fifth of the population, or in the proportion of 1·12 lbs. per head per day.

A still greater quantity of food is derived from pasture land than from arable land. In Great Britain there are about 16,000,000 acres of land in pasture, clover, etc., to about 6,000,000 in grains of all kinds; and ever since it became easier and cheaper to import corn than cattle or sheep, the tendency of agriculture has been to diminish the home production of corn, and to increase that of animal food. The farmer finds that it pays better, and he adapts his cultivation accordingly. Without giving the absolute quantities of acres in permanent pasture, and the number of cattle in the different parts of the country, the following proportions will indicate where animal food is mostly obtained:—

	Percentage of Acreage under permanent Pasture.	Number per 100 Acres under Crop, Fallow, and Grass.		
		Cattle.	Sheep.	Pigs.
England	43·2	15·9	84·8	7·0
Wales	60·4	23·3	107·5	6·8
Scotland	25·1	22·9	157·6	2·9
Ireland	64·2	23·8	29·7	7·0
Great Britain	42·0	14·0	95·8	6·3
United Kingdom	49·5	19·7	74·3	6·6

In proportion to area, therefore, Ireland and Wales have the largest acreage under permanent pasture, whilst Ireland has the largest proportion of cattle, Scotland of sheep, and Ireland and England of pigs. In 1869 there were altogether in Great Britain 5,300,000 cattle, 29,500,000 sheep, and 1,900,000 pigs; and the quantity of meat annually obtained from such stock may be calculated as follows. Probably about one fourth of the cattle, and one-third of the sheep are annually slaughtered. Taking the cattle to give on an average 500 lbs. of meat, the sheep 50 lbs., and the pigs 60 lbs. each, we have a total of 1,100 million lbs. of meat, or in the proportion of 45 lbs. per head of the population per annum or 0·16 lb. per head per day. The pig is extensively used as an article of food, but it does not take the place of butchers' meat. There is, moreover, a large quantity of poultry consumed. In Ireland the agricultural statistics give the number of them at about 0·68 per acre, and at this calculation there may be in Great Britain as many as 20,000,000 heads of poultry. The products of the dairy to be added are not less important. In 1869 there were in Great Britain upwards of 2,000,000 cows; at 180 lbs. of butter each, they will give about 385,000,000 lbs. of

butter; and at 3½ lbs. of cheese each, they will give 709,000,000 lbs. per annum, besides some 4,000,000 gallons of milk per day.

But I fear that we may lose ourselves by attempting to enter into details of the exact quantity of food produced in Great Britain; nor is it easy to state precisely what should be included within the term of home produce. The fisheries are great sources of supply. To us the sea appears a scene of waste, yet the fisherman finds it more prolific than the richest land. Once in a year, an acre of good land, carefully tilled, produces a ton of wheat, or two or three cwts. of meat or cheese. But the same area at the bottom of the sea, on the best fishing grounds, yields a greater weight of food to the persevering fisherman every week of the year. The herring is largely used for ordinary food by the labouring classes, as also are mackerel and many other kinds of fish.

What is to be lamented—if we can lament a fact so universal in its application—is the extreme uncertainty which attends the cultivation or production of any description of food. Greater, indeed, than any danger of the cessation of imports, is that of any loss of the crops at home. In England there have been famines in days of old, and very severe ones, from bad seed-times, long and severe winters, droughts, incessant rains during summer or harvest, tempests, or zymotic diseases of the wheat plant. Even in comparatively modern times, there have been years of great scarcity; whilst the potato famine of 1845-46 is still in our remembrance. But we are surrounded by corn-growing countries, and we have only to open the doors and food comes in from all quarters. If any one wishes to know what a famine is, let him read the reports on that in Orissa and Bengal, in 1867. India is, governed by one climatic system; everywhere it is the monsoon that waters the earth, and any partial disturbance of the different branches and currents causes partial famine. Let it be exceptionally early or late, unusually abundant or scanty, and when such a disturbance takes place a famine is certain to follow. Unfortunately, there are no countries near, to supply food to India. China has never anything to spare. The countries of south-western Asia are poor; great natural barriers separate India from the countries of central and northern Asia, themselves poor. Whatever may be the want it must be met with in India, or it will not be met at all. If, ordinarily, we may say that we are safe in England against such extreme misfortunes, there is still no doubt that we are year by year greatly dependent on good seasonable weather. A succession of wet days, or a continuance of dry weather, will do more mischief in a week than months of labour can repair. Look at the

average produce per acre in Ireland for a number of years. Comparing 1861 with 1865, the average produce of wheat per acre was 9 cwt. in one year, and 13 cwt. in another; potatoes, 1·6 tons per acre in one year; in another, 3·6, and even 4·1. And a light or a heavy crop makes a wonderful difference in the aggregate. Even a few pounds a bushel, more or less, comes to millions of pounds of human food, whilst the murrain in the cattle or sheep may sweep away in a season the resources of whole counties.

What may be done to put ourselves on the safe side in a question of such urgency? Reform the Land Laws; control, if need be, the action of landowners as regards their right of property, so as to secure the rightful and beneficial use of land in all cases; extend the use of machinery in agriculture; improve the condition and prospects of the agricultural labourer; introduce other descriptions of culture adapted to the soil, and capable of being attended to by women and persons unable to pursue the harder tasks of cultivation; introduce technical education among farmers; use, to right purpose, every inch of ground in the kingdom; and last, though not least, open up the trade of the country, so that the wealth of the country, the power of purchase, may increase; for if, unfortunately, at any time the harvest should fail and the herd perish, there will still be the granaries of the world open to us, and we shall be able to exchange our produce and merchandise for whatever may be necessary to deliver us from the dire effects of dearth or famine.

LEONE LEVI, F.S.A., F.S.S.

THE introduction of a Bill by Mr. Stapleton, M.P., for compelling the Water Companies of London to furnish a supply of water on Sundays, is a most important contribution to the Sanitary amendment of the Metropolis. We hail with pleasure Mr. Bruce's declaration, that the time is fast approaching for making arrangements for a more complete supply of water, and the obligatory reception of it by every house. Compulsory cleanliness is even more necessary to a community than compulsory education; and we trust that the intended scheme will ensure the application of strong pressure upon the landlords and owners of house property at the East End, most of whom do not care whether their tenants live or die, so long as they get their rent, and are not called upon to make improvements.

HOW TO COOK AUSTRALIAN MEAT.

SECOND ARTICLE.

In my article on this subject, published in the first number of the "Food Journal," I related the experience which I had gained in cooking and preparing for the table some of the tinned meat from Australia. I have not done with that form of imported meat yet, and have an experiment to relate that is even more succesaful than my first. However, accident put in my way a small quantity of Bancroft's Desiccated Meat, my experiences of which I now relate. If the tinned meat comes before the public in a strange form, and at first sight not very presentable as an article of food, the desiccated meat is still more strange in appearance. "Call that meat?" I said, when I first saw it,—"it looks much more like mahogany sawdust;" and so it does. An examination, however, soon led me to take a considerable interest in it, to award it a very high place in the scale of Australian meats, and to pronounce it to be an exceedingly nutritious, wholesome, and useful food. The courtesy of the importers placed two pots of mutton and two of beef at my disposal, with which I experimented, and obtained what, I think, were very satisfactory results.

I ought perhaps to say that the first specimen I had was at least two years old, and that the tin which contained it was opened when the sample was laid before the Food Committee of the Society of Arts in 1868, so that there can be no doubt of its being very preservable; and it is by no means the least of its valuable properties, that a portion may be used and the rest kept for months, or even years. I extract from the "Journal of the Society of Arts" the following description of it, given by Mr. Orr, the agent in Glasgow:—

"It is dried on plates, by steam. The plates are tinned so as to prevent any oxide from getting into it, and it is then ground. Nothing is done to preserve it except desiccating it—first drying it and then pounding it. Four pounds of fresh meat are reduced to one pound without losing any nutritive qualities. There is no salt with it, but it is simply dried meat."

To this I would add that the cost of it is 1s. per lb., equal to 4 lbs. of fresh meat. There is not the slightest use in my detailing

all the steps I took to arrive at the best mode of preparing it; I shall simply content myself with publishing the results. In all cases, it will be understood that I am dealing with a quarter of the quantity contained in the canister, at a cost of 3*d.*, which is equal to 1 lb. of fresh meat without bone, say 7*d.*

Before it can be used for any practical purpose, it is necessary that it should be soaked for some considerable time in water. For some dishes, it is advisable that it should be soaked in cold water for not less than five hours; for others, it is better that it should be put in a stew pan, and allowed gently to simmer for about two hours. This, however, must be carefully attended to, or failure will result, for nothing can be done with it until it is swollen out and softened. It is easy enough to tell when this takes place, by its being perfectly smooth in the mouth when tasted. The only way in which it can be used as it is, is by spreading it upon bread and butter, when a very good sandwich is the result. Too much should not, however, be eaten in this way, or dyspepsia will follow, as it must take, I should think, five or six hours properly to digest. I will now give some half dozen ways of treating this desiccated meat. If my directions are followed to the letter, I am sure that those who adopt them will be as surprised and pleased as I was at the tempting little dishes I turned out. I have not confined myself to any particular class of eaters; some of my recipes are, however, especially adapted to the limited purse of the working man's wife, to whom I have a sincere desire to render help and assistance in these days of dear butchers' meat. Neither have I given any particular method of making gravy, for which the meat is peculiarly adapted; with regard to this latter article, and remembering how the responsibility of it weighed upon the immortal Mrs. Todgers, the presiding deity of the Commercial Boarding House in "Martin Chuzzlewit," I can only say that no one need sigh for the sake of "gravy," with a tin of desiccated meat in the cupboard.

One of the simplest ways in which the desiccated meat can be used, is to turn it into sausage meat. Soak a quarter of a tin of meat in a pint of cold water for six hours. Knead well into it a handful of bread crumbs or mashed cooked potatoes, with about a tablespoonful of flour. Make up into little balls, and fry in dripping, lard, or butter. If a machine is handy this may be put into skins and made into ordinary sausages.

There is a dish that belongs specially to pig-killing time in the country, but which one never sees in London, except at cooked meat shops in poor neighbourhoods, where it is in great demand,

particularly on Saturday nights, under the name of "faggots." Why faggots I do not know. I suspect it is a corruption of "fag ends," which are just what they are in the country,—the little corners and ends that are cut off in trimming the joints of the animals. The desiccated meat makes admirable faggots, as follows:—Soak the meat (beef is best) in cold water for six hours as before; take a tin baking-dish and grease the bottom and sides; shred two onions fine, and mix some bread crumbs and flour with the meat until the whole is tolerably stiff; lay it in the dish and divide with a fork into squares; flour it all over, and put a piece of butter or dripping in the centre of each square; pour in at one corner, gently, about half a pint of water; put it into a hot oven, and let it bake for an hour.

A capital stew may be made as follows:—Place a quarter of a tin of mutton in a stew pan with a pint of water; put the lid on tightly, and let it simmer on the hob for two hours. Cut up a turnip, a carrot, two onions, and four potatoes, and add them, with enough water to cover the whole, to the meat. Boil gently till the vegetables are done. More water may be added if necessary.

To the making of soups, there is no end; but if I may be allowed to suggest one here, I would say, take any bones that are sweet and fresh, boil them for four hours in plenty of water, add a tablespoonful of the desiccated beef, and flavour and season at will. Another soup can be made with a quarter of a tin of meat, simmered for two hours in two pints of water, with a carrot and turnip cut up small.

A very savoury meat pudding may be made as follows:—Make an ordinary crust, and line the bottom of a white basin, fill it up with a quarter tin of meat that has been soaking for six hours, add a sheep's kidney cut up, and a piece of butter, and season to the taste. Allow plenty of room for the meat to swell in laying on the top crust, and boil for an hour and a half.

A roley-poley pudding may be made with the meat, in the same way as with jam. After stewing the meat gently for about two hours, mix with it a piece of butter or dripping about the size of an egg, and then spread it thickly over the rolled-out crust; pepper and salt it a little; roll and tie it up in a cloth, tying the ends very tightly; boil the usual time, according to size; with some of the meat make a gravy, which pour over the pudding when served.

Potted meat merely requires a gentle simmering for about four hours; it may then be beaten up, and seasoned at pleasure, and put into pots, when it becomes a most delicious breakfast compound.

The following will, I think, prove an acceptable dish to many:—Soak a quarter of a tin of beef six hours, in just as much water as the meat will take up, boil some grease in a stewpan, roll some little balls of the meat in flour, and drop them into it, lifting them out almost immediately with a fish slice. Make some gravy with about a tablespoonful of the beef, thicken it with flour, flavour it with a burnt onion, pour it over the fried balls, and serve with sippets of toast.

A very delicious dish may be made as follows:—Make a light batter according to taste, only the lighter the better, enough to half fill an ordinary pie-dish; simmer a quarter of a tin of meat for a couple of hours; when done, pour it into the batter, so that some of it shall show above; place it at once in a hot oven, and bake till nicely brown; make a gravy as before, and pour over when ready for the table.

The above are some of the more homely and easy ways of making the desiccated meat useful in a family where no cook is kept, and not much time can be given to cooking, and where economy is a matter of the highest importance. Not one of the above dishes need cost more than *1s.*, and some of them not more than *4d.*; and those who try them will, I think, agree with me that, if cheap, they are the reverse of nasty. I have said nothing about beef tea or mutton broth, because there is such a difference of opinion on these matters, some preferring one thing and some another; but without saying one word in disparagement of any other form of concentrated meat, I am certainly of opinion that broth or beef tea made from the desiccated meat is the most wholesome and nutritious, simply because it is not mere extract, but because the liquor actually holds the particles of meat in solution; and, besides acting as a stimulant, gives the stomach something to feed on.

Let me conclude my paper by giving a recipe for a "devil," which, I believe, will be an agreeable novelty to those who like such dainties. Heat a stewpan or braiser over the fire till butter frizzles, and directly it catches, take a handful of the meat and sprinkle it over the pan, which must be continually shaken. Make some buttered toast, and, when the meat begins to burn, spread it over the toast, and add cayenne pepper *ad libitum*. If beef is used, a small quantity of mustard may be laid on the toast.

ANNE ISABELLA LARKINS.

WASTE OF FISH FOOD.

To a reflecting mind, the sad and wanton waste in our fish food is indeed deplorable to contemplate. Immediately a fish puts his head, so to speak, within our reach, he is pounced upon by us, to be hurried off and sold, helter-skelter, without one thought or care as to his size or condition; we only wait to see that it is really a fish, and away he goes. There can be but one result of such thoughtlessness. Slowly but surely are our best fishes decreasing, and the increasing price of them speaks volumes for our carelessness. Can we wonder at the scarcity of the oyster, when it is well known what little care we took of him years ago? Conversing the other day with an old seaman, who has been all his life engaged in the North Sea fisheries, we spoke of the oyster, when he complained that the oysters which the fishermen haul up in the trawl nets are no longer the perquisites of the men, as heretofore, to be sold by these benefactors of posterity at 1*s.* a bushel, and he considered that they were losing a legitimate right thereby. We can well remember when very little care was taken of small oysters, and many of them, when brought to market, bore two or three smaller ones upon their shells; too little to be taken notice of, but thrown aside as useless with the shells, when the larger oyster was devoured. Now, it is different. A gentleman of our acquaintance who has studied the question for years, would weep for joy could he now see three small oysters or "spat" upon the shells of his adult testaceous pets! We can well recognise the possibility of his predictions when he exclaimed, while lecturing upon this subject, "Behold the last oyster, for to this we are fast coming."

The crustacea too are speedily following the fate of the oyster, and already may we search Billingsgate whole days for a crab, without being able to see one; nor can we wonder, when we find them brought to shore with a bunch of red, sponge-like substance, as big as a navvy's fist, adhering to them, telling the tale of slaughtered millions.

Of all our edible fish, there is none upon which the call is so great, we believe, as upon the lobster, or "cardinal of the deep," as once called by some learned writer, who had evidently not much knowledge of his subject, reminding us of the young lady who,

when asked if she liked lobsters, said, "Yes, I like them very much indeed, especially the red ones." Every day this highly-prized fish is looked for with as much precision as we look for the cream in our tea; and our appetite is so nice that we cannot get down a bit of turbot without swallowing scores of lobsters in the shape of spawn. What a pity it is we have any turbots to swallow at all; nor should we, as far as our care is concerned, but for their great fecundity. Here again we pursue our waste; experience showing us, after careful examination and observation, that nine out of every ten turbots brought to shore are females. The preponderance of female fish over male ones is well known in the trade, this kind being rather over the average.

We have now to pay in market 3*s.* to 4*s.* for a crab, and more still for a lobster; but who is to blame? Every one's business is no one's business; and so we go on, in spite of the manifest probability of exhaustion.

From the lobster, we will glance at his delicate prototype, the prawn. These we find at times literally full of ova ready to be deposited, and which are entirely wasted, and not made any use of at all, as is the spawn of the lobster. Again, the buntings, or small prawns—little things below the average dimensions of shrimps—are caught by myriads, quite regardless of size or value, and are seen almost daily in our markets, where they are sold, either by themselves or mixed with shrimps, for next to nothing. Who can wonder, then, that prawns fetch 8*s.*, 9*s.*, and even 10*s.* per lb., while such wholesale waste goes on with impunity?

Of course such a fish as the cod does not escape our rapacity, and we eat hundreds of thousands of their ova with great gusto without a thought of the waste; nor do we stop here. We have hooked and trawled for haddocks at all seasons, until the supply is limited, and now we seize the baby codlings (while we write they are lying before us, some of them weighing not more than 8 ozs.), hurry them off to market, where the costermonger converts them in a few hours into real "Finnon Haddies." And so the waste goes on.

Whitebait used formerly to come in the summer, but now we cannot wait for the legitimate supply, and so the Firths of Scotland must be dragged for the soil, or fry of the herring, to act as a substitute. Here too is wanton waste of essentially a poor man's fish! Again, nearly every box of soles which enters Billingsgate Market contains a large quantum of very small soles, or "tongues," as they are called by fishmongers, and which are nearly worthless. Then why bring them to market, we ask? Why, partly to deceive the

purchaser; and partly because the Frenchman buys them up, and actually makes soup of the infants of one of England's staple fish! We devoutly wish that "Mossoo" would stick to his frogs, and not show such a wasteful predilection for our English "tongues." Thus we find that soles cost 4*s*., and more, per pair, and no wonder; while our newspapers denounce the unfortunate fishmongers' large and extortionate profits.

If we take hold of a smelt just now, we find it literally covered over with a substance like grease, which, if examined, we discover to be the spawn of this fish. No wonder that a bloater-box full of these little fishes was only a week or two ago worth £3.

The plaice, again, a universal source of food with the very poor of of our population, is seen in March full to bursting with its roe. At this time they are strong and disagreeable, as well as being very thin when the roe is removed. At other seasons, it is possible, with judicious treatment, to substitute these fish, for economy's sake, for dearer kinds; but now it is impossible, from their unpleasant flavour. The result is, that this waste is perpetrated for very little pecuniary profit by our thoughtless fishermen.

We still have people with appetites sufficiently debased to crave for the roe of the salmon; but, thanks to legislation, their attempt at spoliation is futile, if we exempt the Frenchman, who somehow does manage to obtain a supply of foul salmon in spite of the vigilance of our salmon inspectors. We could instance many more fish which come to our market, equally little care being taken of their welfare, but we think that sufficient has been said to show the great necessity for doing something to stop the awful waste of one of our greatest sources of food.

As a counterpoise of the foregoing, we are justified in calling attention to the wonderful effects of salmon cultivation and protection already manifest. This fish has been established in Australia for ever, we hope, and from Scotland and Ireland come the most promising reports of their abundance this season. The price of salmon is already very much lower than has been known for years at this time of year; and we may reasonably be allowed to hope, that some of this, at least, is due to the exertions of those who have so long had the cause of the salmon at heart.

William Moore.

SUGAR POISONING IN CHELTENHAM.

WE have received from Cheltenham a sample of sugar, so fearfully adulterated with chromate of lead, that we wonder how any of the unfortunate partakers of it survived to tell the tale. The sugar in question appears to be what is known in the trade as "pieces," to which the chromate of lead has apparently been added, with the intention of bringing up the inferior article to the appearance of the best Demerara. The attempt, however, has been made so clumsily that the naked eye at once detects the mixture, the lead being in lumps large enough to allow of its being picked out by the fingers. Appended to the sample is a somewhat remarkable document, in the shape of a series of printed apologies from the grocers who sold the sugar in Cheltenham, the wholesale dealer in Bristol who supplied the article, and the refiner who manufactured it. We think that none of the parties implicated emerge very creditably from the transaction, although the retail tradesmen declare that they knew nothing about it—the Bristol dealer says the same—while the refiner also pleads innocence, oddly enough imputing the mischief to "some experiments tried by the manager of his works" about the time that the goods were delivered. We are curious to know where was the necessity for trying experiments on an article like sugar, which we buy in the full belief that it is perfectly pure; and for what reason a dangerous material like chromate of lead happens to be in the refinery at all. We presume that the case was brought before the magistrates to be dealt with in open court, so that the Cheltenham residents, who have the reputation of paying good long prices for their provisions, might at all events know what to eat, drink, and avoid.

NEW YORK is beginning to feel the influence of the completion of the Pacific Railway. Formerly teas were imported *vid* the Isthmus of Panama, but now this route is superseded by the shipments forwarded from San Francisco by the new overland line. If the railway freight is not too heavy, New York can thus be more cheaply supplied than by sea, while the qualities will be fresher and altogether superior. The ultimate effect will be, that New York will not only be converted from an import to an export trading station, but that all the teas, silks, and other Asiatic products will be forwarded through it, for the supply of Europe.

EPIDEMIC DISEASES IN PARIS.

The smallpox has been terribly prevalent of late in Paris, and rose in February to an alarming pitch. Happily, it is said, there is at present a decrease in the number of cases. The authorities have been actively engaged in combatting the evil, and in providing against its return, by rendering vaccination as effective and as facile as possible. A cow, with pustules developed, has been taken to each of the public establishments, from the Ministries and the Hôtel de Ville downwards, and nearly the whole of the employés, and their chiefs, have been vaccinated.

It appears, however, that, until last month, the deaths from typhoidal fever much exceeded those from smallpox. The following returns are said to be supplied by the chief officers of the hospitals of Hôtel-Dieu, Saint-Antoine, Lariboisière, Clinique, Pitié, Beaujon, Charité, Necker, Maison de Santé, Cochin, Saint-Louis, Maternité, Midi, Lourcine, Sainte-Eugénie, Enfants malades, Salpétrière, Bicêtre, Incurables, Ménages, Larochefoucauld, Saint-Périne et Chardon-Lagache.

1869.	Total Deaths.	Deaths from Smallpox.	Deaths from Typhoidal Fever.
January	1,176	30	15
February	1,147	18	22
March	1,316	27	15
April	1,260	21	37
May	1,088	21	22
June	1,020	22	14
July	963	13	12
August	1,004	12	25
September	954	18	42
October	986	14	57
November	1,154	31	82
December	1,098	45	30
Totals for 1869	13,166	272	373
1870.			
January	1,241	62	34
February	1,392	100	23
Totals (14 months)	15,799	434	430

DOMESTIC RECIPES.

The Editor desires to appeal to his readers, and especially to the ladies, for contributions of recipes for cheap, tasty, and serviceable dishes, both for poor households and those of the higher classes.

ALE JELLY.

Put an ox-foot into three quarts of water; boil it till it leaves the bones quite bare; strain the stock, and when it is cold and the fat removed, cut it into four, and put it into the pan with 1 lb. of Lisbon sugar, the juice of three lemons (with the rind, pared very thin) seven cloves, a small teaspoonful of powdered cinnamon, and three-quarters of a pint of very weak pale-coloured beer (say a pint of Bass's ale); when these are all in the pan, add, lastly, two eggs well beaten, the whites and *shells* of three others; boil for five minutes, quickly, stirring all the time; when it has risen up well in the pan, take it off the fire and set it on the floor without stirring it. While settling, the jelly bag will be found quite clear by the time a pint has been through, so that another vessel must be in readiness; and as soon as it runs clear, the finest must be put back very gently into the bag, so as not to shake it. The clearness depends on its quick boiling, and the quantity, on having the material that surrounds the bag well heated, so as not to chill it. A metal mould should be used, as the jelly will not turn out of earthenware.

TO DRESS COLD MEAT.

Cut cold meat into thin slices, put them into a saucepan with a lump of butter, a little flour, a bunch of sweet herbs, pepper, salt, and a little gravy; simmer it gently for five minutes, and place the meat in a dish. Have ready a little gravy, thickened with the yolks of two eggs, beat it up in a very small quantity of vinegar; put it over the fire to heat it thoroughly, and pour it over the meat in the dish.

MULLIGATAWNY SOUP.

Cut into small square pieces some very tender lean mutton; toss it in butter, together with sufficient minced onion; put both into rich stock, with a small quantity of rice, and sufficient curry-powder mixed smooth in some ketchup, lemon juice, or white wine; simmer gently until the rice is quite done, then serve all together in a tureen. A little preserved tomato (strained) is a great improvement.

PUNCH A LA FRANCAISE.

The ordinary punch, *à la française*, is prepared in two ways. First, a litre of rum (rather more than a pint), and 750 grammes of broken sugar (about 1¾ lbs.), are placed in a saucepan. The sugar must be burnt until it becomes candied, brown in colour, and reduced by one-third. A litre of boiling tea should then be thrown in, with the juice of half-a-dozen citrons, and as many oranges. Drink immediately. The second process is calculated more especially to produce a ladies' punch. Rather more than 2 lbs. of sugar must be melted in a large saucepan over the fire, a good half tumbler of water or tea poured over to moisten it, with the juice of two lemons and two oranges. When the sugar is well melted, pour into the saucepan a bottle of rum and a bottle of brandy, together with the amount of tea necessary to modify its strength. After adding the tea, care must be taken that it is sweet enough. This punch must not be allowed to boil, but only warmed. Just before serving, squeeze the juice of half a dozen oranges through a sieve into the mixture.

A CAPITAL LOBSTER CURRY.

Take the lobsters from the shells, divide them into portions, and place them in a pan; then slice a couple of onions, which should be slightly fried, and add four teaspoonfuls of curry powder, butter, and flour for thickening, and a pint of gravy, containing in it some of the lobster powdered. After boiling for half-an-hour, skim it, and pass it through a fine sieve over the remaining lobster in the pan, adding lemon-juice and salt. It must simmer for half-an-hour, and just before serving, which should be done hot, with plain boiled rice, add two spoonfuls of cream.

A CHEAP SOUP.

For 40 lbs. of soup (for 2*s.* 10*d.*), take 6 pints of haricot beans, placed at night in 1 gallon of water to soak, in a 6-gallon cooking vessel. Next morning, add carrots and onions (5 lbs. of each), 1 gallon of turnips, 3 cabbages; Patna rice, 2 lbs.; salt, 10 oz.; black pepper, ¾ oz. Stew for four or five hours, well stirring occasionally; 1 lb. of dripping and fibre from stock-pot may be added.—*Public Opinion.*

VEAL CUTLETS.

Cut them in shape; beat them; prepare as usual, with egg and bread crumbs; brown, and then stew them in a rich gravy, in a *slow* oven, for an hour, in a covered jar.

NOTES OF THE MONTH.

A GOOD example may be deduced from the French law, enacted during the reign of Charles V., relating to pork butchers, pastry-cooks, and those tradesmen who make it their business to roast fowls, etc., for the public; a business, by the way, always far more common in France than in England. These latter were forbidden to throw any of their victuals in the ordinary sewers. They were not allowed to roast old geese or capons and lean fowls; neither were they permitted to cook unwholesome meat or flesh that was not well bled. They were forbidden to rewarm any vegetable or soups for their customers, or any sort of meat that had become cold. They were also forbidden to keep meat more than three days, and fish more than thirty-six hours. By order of the King, pork butchers could only use flesh which had been verified as wholesome and good. Sausages and puddings were to be made of good meat and good blood. Finally, the pastry-cooks were compelled to swear that they would only employ good and fresh meats for their pies; and they were forbidden to sell any pasties which were more than a day old,—"*aulcuns pastez aagez de plus d'ung jour.*" If improvement has been made in the knowledge of sanitary matters, the actual laws relating to them are not, by any means, so fraught with precautions nor so strict as this decree of the fourteenth century.

THE *Revue Maritime* gives an interesting account of the cod and herring fishery carried on by the French—the former off the Newfoundland coast, and the latter off that of Scotland. The former has been very successful during the past year, attributable to the great quantity and long continuance of the *capelan*, which is a favourite bait for cod. The statistics of the herring fishery show much larger returns than those of our native fishermen off the Scotch Coast; and this arises, according to the report, from the much larger area over which the French boats fish. They take up their stations some thirty miles from the coast, whereby they not only secure an increase of fishing ground, but have the first pull at the herrings, which always travel from north to west. The hint is worth taking by our fishermen.

THE Committee for encouraging the use of horse flesh as food in France has presented to the Minister of Agriculture a report, which contains an approximative estimate of the consumption in that country. In Paris, from the 9th July, 1866, when the first horse flesh butchery was opened, to the 31st December in the same year, 902 horses (a few mules and asses being included) were slaughtered, and their flesh, averaging for each about 440 lbs. in weight, gives a total of about 180 tons; in 1867, the total consumption of this kind of meat rose to 430 tons; and in the following year it amounted to rather more than 480 tons. In these two years and a half the totals were 5,475 horses, yielding 1,095 tons of meat, without including the livers, tongues, hearts, etc., which were also used as food. The price of horse beef in Paris is less than half that of ox beef. The returns for the rest of France are not complete, but judging from partial accounts, and according to the number of towns in which this kind of meat is used, the committee believes that the total consumption amounted, in 1868, to 2,000 tons. The use of horse beef is said to have increased considerably last year, when butcheries especially devoted to it were opened at Toulouse, Sedan, Toulon, Charleville, Angers, Marseilles, Havre, and other towns.

MR. CONSUL BRACKENBURY reports that a large trade can be carried on between Portugal and England in the shipment of cattle, 2,500 head having been sent over from Lisbon in the course of the last year. The great drawback at present is the financial policy of Count de Samodaens, Finance Minister, who proposes to put an export duty of 4 milreis per head, (18*s.*), which is equivalent to the profit made by the breeder. As this policy is only a portion of one equally destructive to the tobacco, sugar, and wine trades, we fear that Portugal will not progress whilst Count de Samodaens is Minister of Finance.

A NEW feature in the provision trade has been ventured upon by Mr. Tallerman, in connection with the Australian meat supplies, in the shape of a monthly auction of preserved beef, mutton, and tongues. Two have already taken place at the Hop Exchange, Southwark, where, amongst other things, 100 tons of cured mutton were sold at prices varying from 3½*d.* to 6*d.* per lb.; 1,000 sheep tongues fetched about 1*d.* each, and ox tongues from 1*s.* 1*d.* to 1*s.* 2*d.* It remains to be seen, however, whether the respective purchasers at these auctions will resell the meat to the public under its proper name.

The following has been received from Mr. E. Kinch, of the Royal Agricultural College, Cirencester:—"A sample of elder wine recently came under my notice, which had been found to produce serious vomiting, when partaken of to the extent of about 8 ozs. A considerable quantity of brandy was added to the wine, with the view of remedying the disagreeable consequences, but without effect. The maker had been careful not to use a copper pan in the manufacture, but a clean galvanised iron vessel, and a wooden spoon to stir the ingredients. The wine proved on examination to contain zinc, dissolved by the malic acid of the elderberries, in quantity equal to nearly 9 grains of white vitriol per pint. About 10 grains of sulphate of zinc are required to act as an emetic in the usual way, but it would naturally be supposed that in such a vehicle as elder wine, a smaller quantity would produce the same effect. Milk is well known to attack zinc surfaces, forming lactate of zinc; and M. Ziurek has lately called attention to the fact that water, kept in zinc reservoirs, or collected from zinc roofs, is invariably contaminated with that metal, and therefore should not be used for domestic purposes."

Consumption of Fish, &c., in Paris in Passion Week.—The sale of fish and other articles of *maigre* diet at the Paris market in Passion Week is always enormous. The following is the account for the present year:—Salt cod, 55 tons; pickled herrings, 20 tons; skate, 2½ tons; shad, 4 tons; salmon, 300 lbs.; water fowl, 3,000 head; eggs, 1,500,000; and butter, 3½ tons. The consumption of eggs at this season is immense; red eggs, boiled with alum and logwood, and cooked eggs of other colours sometimes, are sold in every wine shop in France, and the consumption is said to be at least seventy millions!

NOTICES OF BOOKS.

We have received the following books and pamphlets, which we hope to notice more at length on another occasion:—

"The Animal Kingdom." By Ellis A. Davidson, Esq. Cassell, Petter and Galpin.

"Our Bodies; an Elementary Text Book of Human Physiology. By Ellis A. Davidson, Esq. Cassell, Petter and Galpin.

"Mental Exertion: its Influence on Health." Edited by A. Leared, Esq., M.D. Hotten, Piccadilly.

"Report of the Health of Liverpool." By W. S. Trench, Esq., M.D., Medical Officer of Health for the Borough.

"Things that a Child Ought to Know: Our Vegetable Food." T. Nelson and Sons, London and Edinburgh.

"Potato Culture." By F. Wilkins.

THE

FOOD JOURNAL.

SALMON FISHERIES, AND RIVER ECONOMY.

Our home food resources have received a valuable addition within the last ten years. We have quadrupled the amount of salmon captured in English and Welsh waters, and we have lowered the price of salmon in our markets to at least one half what it cost in 1860. To the question, How have we accomplished all this? the answer is simple enough. Since 1860, English rivers have, in some measure, again been treated in their almost forgotten capacity as food-producers. In that year, the restorers of our salmon fisheries, against much opposition, obtained a recognised footing in England.

After having, for some twenty years, carried on a brilliant campaign in Ireland, against the ignorance and selfish cupidity which were fast reducing the Irish salmon waters to barren wastes, the promoters of restoration turned their attention to England. Fortunately the restorers succeeded in being recognised by Lord Palmerston's Government; which, in July, 1860, procured a Royal Commission to enquire into the state and capabilities of our English and Welsh salmon rivers. Six months after its appointment, this Royal Commission had accomplished its work, and laid a large mass of evidence, gathered from the neighbourhoods of the different rivers, and a masterly report upon the whole question of salmon restoration, before the Queen and the country. The result was, that an Act of Parliament was passed in 1861, and a department formed under the Home Office, for the purpose of extending general protection and supervision over the salmon fishery interests.

In fact, the salmon restorers, fresh from their conquests in Ireland, made short, sharp, and decisive work; and, in the space of one year, carried out in England a total reform in the mode of husbanding the food resources of our rivers. They, moreover, laid the foundation of a still larger reform, with respect to the entire system of our river economy. This latter part of their good work

is still a long way from being finished; indeed, beyond laying the mere foundation, it is hardly begun as yet.

No part of our domestic economy has been allowed to lapse into such wasteful confusion, as that which pertains to our fresh waters. Countless thousands of tons of the most nutritive manures are drafted down the English rivers day after day, to be lost for ever in the ocean, while ships are chartered at enormous expense to cross the seas to distant lands for the purpose of collecting for the agriculturist guano and other fertilising agents, to be applied to our exhausted soil. This stupid waste of valuable sewage has, however, at last attracted attention;—companies have been formed—and upon farms, here and there, experiments are being carried on, to find out and demonstrate how we can best utilise the sewage of our great towns by returning it to its proper place, for the enrichment of the land. It is impossible at present to more than allude to the further wasteful pollution of our rivers by mines and factories. Enough to state that, from the very head waters, down to the tideways, we find pollutions existing and spreading everywhere, causing not only destruction to the fish for miles along some streams—and in certain cases decimating entire rivers—but also sickness and death, to a fearful extent at times, to both man and beast, along the banks.

Our river economy has, moreover, been wastefully taxed by the canal system. Most valuable as it undoubtedly was before railways came into being, we went altogether too far with it; and we have to pay the penalty now, by finding the beds of our rivers in many places dried up and parched during the summer months. Tapped to supply canals and other artificial water conduits, only stagnant pools remain in the hollows along the course of too many of our rivers. These pools taint the air as one passes, sending a species of sickly malaria into the valleys that would have been filled with health-giving fragrance, did they still possess their natural supply of running water.

All this pollution and waste of our fresh waters makes it no easy task to secure a pure supply for the domestic purposes of the towns and cities. Daily it becomes a more costly and difficult matter to meet the demands under this head. Not only is this the fact as regards the supply of water to London, but if we take up the local journals we find them all full of suggestions, schemes innumerable, and meetings of corporations or local boards, each attempting to remedy the all but universal complaint, which testifies that the present water supply is more or less defective everywhere, either as regards quality or quantity, or both.

In connection with our river economy, these matters, quite irrespective of their bearing upon salmon fisheries, are of the most serious moment. But the smallest reflection upon the pollution and water waste to which we have alluded, will convince anyone who cares to think about it, that the condition of our English rivers as salmon preserves is not very promising. Of this view of the question we obtain constant practical proofs from the reports of the Salmon Fishery Inspectors. For instance, we read an account of one river in Devonshire, where "no less than seven or eight hundred weight of salmon and trout, averaging from one to twelve pounds, were all destroyed," in a few hours, by the pumping out of some mine working during low summer water. In the Canterbury Stour we find upwards of 400 trout and young fry poisoned in 1868, by the drainage from the barracks. In the same year, the effect of pollution upon the Ribble fishery is thus described:—"During the great drought of the summer, the Calder (a tributary to the Ribble) became a mere sewer, the smell from which was frightful, and on the 26th of September, during a flood, the refuse of the chemical works on the Calder, and the Hyndburn, and other deleterious matter which had been accumulating during the summer, came down in a thick stream and poisoned almost every fish of any kind, from its junction with the Ribble, near Whalley, down to Preston." The Alyn, a tributary to the Dee, fearfully polluted by oil works, is thus described by a gentleman this year:—"I got a jug and saucer and skimmed the stream, and in a quarter of a minute filled my jug with the most powerful and offensive black oil. The residence of my mother-in-law, near Pontblyden, is made intolerable by the stench, and the cattle have been seriously injured by the use of the waters." The Inspectors, in their recently published report, congratulate the conservators of the Tyne upon the existence of two impassable stone weirs, that block the ascent of salmon from two tributaries, measuring together some seventy miles of river, belonging to the Tyne basin. It is a novel thing to congratulate the conservators of a salmon district upon the existence of impassable stone weirs. It is done, however, in this case, because those two tributaries are, from excessive pollution, rendered "utterly useless for salmon purposes." But it is needless to multiply examples. We have good hope that the Royal Commission, now carrying on an investigation with a view to the removal of river pollutions on sanitary grounds, may do more to relieve our fisheries of this particular evil than the Salmon Acts have been able to accomplish.

To husband the water supply, so that the river courses may not be

let run dry, as they do now during the summer months, is another matter which we trust to see more economically treated by-and-by. The necessity for taking some steps for this purpose is daily becoming more apparent, not only as regards our fisheries, but as regards health. The health of the valleys, the water supply of the towns, the beauty of the whole country, are all injured, more or less, in different localities, by the reckless waste of water now permitted. As for the salmon fisheries, what is the use of purifying the streams, or what is the use of getting rid of the mill dam and weir obstructions by ladders, salmon passes, or any other device, if the channels of the rivers continue to be increasingly denuded of their water supply? This waste of water has already been permitted to such an extent that, for many weeks of the open or fishing season, no salmon can possibly ascend the rivers in question; there is absolutely no water in which to travel. Though this is an evil daily increasing, as yet apparently it affects the welfare of the salmon fisheries only in the dry summer months, depriving river proprietors, at the season when the salmon is in prime condition, of all chance of catching the fish which they have been at so much trouble and expense to breed and rear. But the injury goes further than that; it prevents the early breeders from getting up to the spawning beds, and distributing themselves throughout the fresh waters, where they would cast their spawn early in the year, and so help to bring back the earlier breed of salmon belonging to those rivers that are well filled with their natural supply of pure water.

The ruthless manner in which mill dams and weir obstructions of all sorts have been built across the streams, hindering exceedingly, and, in multitudes of instances, totally preventing the ascent of salmon, is another example of how much our river economy needs to be adjusted. This matter received the closest attention at the hands of our salmon restorers. We find that the Salmon Act of 1861 has provided much valuable machinery for rectifying the difficulty represented by weir obstructions. This machinery, however, has not been put in force as effectively as it might have been. Legal power has been given to erect salmon passes on every weir in the kingdom; but those who wish to erect them must provide the funds. Here is where the shoe pinches. Funds have not been forthcoming in anything like the abundance needed. Parliament, though often solicited, would not even supply a skilled engineer to assist the conservators of the rivers in planning the necessary works for erection, whereby the weir difficulty might easily have been obviated. Several of the first salmon ladders, erected at considerable cost, failed in consequence of faulty construction.

There was no proper engineering skill to carry out the work. This threw a further damper upon getting the supply of money necessary to provide a free passage for the fish; and, although some fifty to seventy weirs have had various sorts of passes or ladders of more or less efficacy placed upon them, our salmon fisheries have not been relieved in this direction at all to the extent we might have expected from the remedies provided by the Act of 1861. So disheartened have many of our most eager salmon restorers become by the slow progress made in overcoming weir obstructions, that they are actually seeking to have another special commission granted by Parliament to inquire into the whole question with reference to the weirs and mill dams now existing in our rivers. This is sought for with a view to enforcing upon the weir owners compulsory measures for the erection of fish ways. We need not go further into this question at present, and only refer to it to show what difficulties still stand in the way of reforming our system of river economy.

Notwithstanding all the abuses that still exist along the rivers (and there are many more than those we have specified), the natural fecundity of the salmon is so great that, by bringing wise protective laws to bear upon the cultivation of the very much prescribed area of water we have now to work upon, salmon restoration in English rivers is already an accomplished fact. Our food supply gathered from the English salmon rivers has been vastly augmented; the price of this delicious food has been amazingly lowered; while a far larger number of men are annually employed in working the industry. The Ninth Annual Report of the Inspectors, just out, contains a most satisfactory record of steady progress towards the further development of the salmon fisheries, which represent one of the most valuable of our home food resources.

HENRY FFENNELL.

FROM the "Annual Report of the Health of Liverpool," by Dr. Trench, we gather that the sanitary state of the borough is improved, the number of deaths during the year being equal to 28·9 per 1,000, being 3 per 1,000 less than the average rate for the last ten years. Judging from the carefully tabulated list of diseases, we should say that Liverpool is watched with a supervision exceeded by few towns in the kingdom. The amount of unwholesome meat condemned in the year was as follows:—81,081 lbs. of beef, 30,767 lbs. of veal, 15,657 lbs. of mutton, 1,827 lbs. of lamb, 5,315 lbs. of pork, 1,679 head of poultry, 4,219 rabbits, 244,082 fish, 263 bags of shell fish, 9,574 oysters. A curious item is appended to this list, viz., of smothered cattle, 278 in number, of which 209 were sufficiently good, when discovered, to be eaten. At the same time, why is there any need for allowing cattle to be smothered at all?

MR. TWINING'S MUSEUM AT TWICKENHAM.

PART II.

We own that we felt fairly puzzled, on our first visit, by the number and multiplicity of the various articles exhibited within the small dimensions of the modest building which forms Mr. Twining's Museum. We wandered away from food proper to the new box-churn, so admirably simple, superseding the old hand-churn of our forefathers; to the plans of the newest fire-escapes and life-preservers for ladies—an invention rendered necessary by the inflated size of gauze and other light and inflammable dresses; to the cork life-belts of Captain Ward, and the air life-belts from Hanover; to the model fire-escape of Mr. Tipler, of Rugby; and to another most amusing and novel invention, a self-acting extinguisher, which puts out the light the moment that the candle burns down to a point marked by a pin. Here were Arnott's stoves and McKinnell's ventilators, Russian baths, specimens of newly manufactured spectacles, and all sorts of external appliances for domestic use; and yet, in spite of all, our excellent and agreeable cicerone declared that in the opinion of himself and of Mr. Twining, the sanitary department was far from complete! We passed on to another section, where the ladies who accompanied us were delighted with endless specimens of things most dear to the female heart,—lace, feathers, flowers, hair-combs, side-combs, bracelets, cottons, braids, buttons, hooks and eyes, threads, gloves of all countries under the sun, snow-shoes for women, and specimens of woollen socks used by Christians in Turkey, of which we can only remark that we saw no reason why they should not be equally adapted to the feet of a Mahometan.

Here, too, we saw a most interesting chart, or rather diagram, showing at a glance the state of sanitary education, drunkenness, and crime, in each of the counties of England; and we may remark, by the way, that the criminals and drunkards, per thousand, are lowest in Cornwall, Cumberland, and Derbyshire, and highest in Gloucestershire, Monmouthshire, Herefordshire, Worcestershire, Cheshire, and Berkshire.

The building itself, which forms the Museum, is made chiefly of a fibrous slab, with a roof of wood and slate. Though not actually fire-proof, it is such as not easily to catch fire; and it is intended to serve as a cheap and economic model of the manner in which such edifices can be erected, whether for

educational or other purposes. The arrangement of the contents of the Museum, we need hardly add, is popular, not scientific; but this was necessitated by the gradual growth of the institution, and, after all, it is perhaps the most practically useful plan. There is a residence for the curator, and a workshop on the premises, and it is warmed by four stoves on Arnott's principle of slow combustion.

The value of sound principles of household and health economy for all classes of society, but especially for the humbler and most helpless classes, we may hope, is gradually finding a due appreciation both at home and abroad; and it is to be desired also that the effective means for acquiring knowledge of these principles, as exemplified in the Twickenham Museum, will obtain in the long run a general adoption. Of course, such economic collections may, and must, vary infinitely both in scale and in character: they may be blended with almost every rational device for popular recreation, and made a place of resort for the sight-lover, as well as for the studious and thoughtful portion of the public; they may be established on commercial principles, or, as at Twickenham, on purely philanthropic ones; they may respond to the special pursuits of any class of men, such as the agricultural, mining, manufacturing, commercial, seafaring, or military sections of the community; and they may be made to represent the requirements and resources of any race, climate, or locality. Thus, for instance, in certain seaports, emigration will claim a distinct collection, and suggest a most interesting one. So again, Mechanics' Institutes and other Associations for self-improvement should allot a space to illustrations of the science of common life, for which tradesmen will readily supply samples, whilst some of the members will take charge of the manual, others of the intellectual, labour. Educational establishments, too, even down to the village school, should get up their appropriate cabinets of useful and entertaining objects, on nearly the same co-operative plan.

In all these cases there will be furnished an interesting scope for the exercise of much discernment and forethought in the selection of the series to be included, and in the utilisation of every available resource for illustrating it. These considerations, as well as the amount and nature of the disposable space, will, in some measure at least, determine in each case the arrangement of the articles, and even of the departments; but, speaking generally, the classification adopted at Twickenham will be found on the whole to be the most practically useful for guidance. One important point to be borne in mind is that, in each department, the illustrations ought

to be as nearly as possible those which a popular lecturer would wish to place before his audience, and that the pith of what he would say is to be appended, as far as space may allow, in the form of readable and familiar labels. We are told that specimens of these, together with drawings and estimates of cheap and compact fittings and appliances, many of which are of peculiar contrivance, will be forwarded by Mr. Twining, on application, to persons who may be prepared to organise economic collections for public advantage. In certain cases, also, duplicates will be distributed, and other assistance afforded. Special documents too can be supplied to persons, duly accredited and introduced, who may wish to organise temporary exhibitions of domestic economy similar to those which have been already held in France, Belgium, Austria, and Italy.

It deserves to be made known that arrangements are being made at this Museum, in connection with the Society of Arts, the Ladies' Sanitary Association, and other societies, for instituting, in London, courses of well illustrated lectures, classes, examinations, and premiums, with a view to promote practical knowledge, health, and comfort, among the people. A portable collection is being prepared for the purpose.

But the care of Mr. Twining for his fellow creatures does not end here. Confined to his house by a chronic malady, he has resolved that the benefits of his Museum shall be brought home to the doors of the inhabitants of London and other large cities. Accordingly, he has prepared a series of "Familiar Lectures" on the applications of science to the requirements of daily life, which he offers gratuitously to institutions established for the advancement of the education of the people. Unable to go abroad himself, he employs, as his "reader," Mr. William Freeman, the courteous and intelligent curator of his Museum, who is supported by Mr. Wm. Hudson, of the London University, secretary and chemical superintendent of the Museum, as his "demonstrator." By their aid he gives, where asked, a series of nine lectures on physics, chemistry, human anatomy, and physiology, which have been listened to with pleasure by the mechanics of Lambeth and the costermongers of Old Street and St. Luke's. These lectures, illustrated by experiments, plainly teach and enforce the old, old lesson which is embodied by Milton in those lines—

> To know
> That which before us lies in daily life
> Is the prime wisdom.

And it is to be hoped that all the seed thus sown broadcast has not

been allowed to fall on hard and stony ground,—in other words, that Mr. Twining's philanthropic labours have not been wholly in vain.

We are told, indeed, that Mr. Twining has gone even further still, and, in several cases, has offered prizes in money for those members of the working classes who, having attended his lectures, have afterwards passed the best examination on the subjects treated of, and that his rewards have been publicly distributed on more than one occasion in London by the hands of that practical philanthropist, Lord Shaftesbury, who has endorsed his strong approval of the movement thus inaugurated.

We have in almost every borough in the kingdom some Museum or other, devoted to a special department, if it be only to preserve coins, mummies, gravestones, and such antiquarian and archæological *in*-utilities. No provincial town of any pretensions considers that it can pass through life comfortably without inaugurating a Museum of its own. But most of these institutions are designed to illustrate the higher walks of art, science, or antiquities, which, though very useful in their way and in their place, do not bear immediately on the daily wants and necessities of the masses. Why should not philanthropic gentlemen in other towns follow the lead of Brighton, and occupy the ground thus left vacant; and inaugurate, each in his own *locale*, an institution which shall impart, in a popular and agreeable manner, by example, and through the eye, that knowledge of "common things," to teach which Mr. Thos. Twining has devoted a long and useful life, and yet of which so many of our middle and lower classes are so exceedingly destitute? We venture to think that this really is a matter which closely concerns not only the mayors, aldermen, and office bearers of our country towns, but also the parochial clergy, and ministers of all denominations.

We will conclude in the words of the *Examiner:* "A visit to the Economic Museum at Twickenham would do good to many a pretentious theorist who has been pondering the extinction of pauperism, and to many a rich donor of imposing forms of charity. This Museum, in a gentleman's garden, is the special product of a thoughtful man, who has kept practical objects always before him. Here is a wise use of money for the benefit of the poor; and the results which may be obtained by the imitation or extension of Mr. Twining's methods of teaching the ignorant and lowly, that most valuable of lessons—the art of helping themselves—are of a fundamental character, and such as concern us one and all."

E. Walford, M.A.

POPULAR FOOD ANALYSIS.

No. 4.—COCOA.

(CONTINUED FROM LAST MONTH.)

We now proceed to the consideration of the facilities afforded by the microscope for the detection of adulteration of cocoa, those offered by chemistry having been already shown in our last number. On examining a seed of cacao theobroma, we notice that it consists, like all seeds, of an outer membrane, or husk, enclosing the useful portion of the seed itself. This latter is covered by a thin skin, penetrating into its substance, and dividing it into irregular portions, called lobes. In carefully prepared cocoa, entirely deprived of its husk, we have therefore only to look for the structures exhibited by the lobes, with their covering, and also those of the embryo, which exists in one portion of seed, so embedded as not to be separable in the process of decortication. It thus follows that, under the microscope, we may meet with three distinct structures in good cocoa, and these we will notice *seriatim*.

1. *The Structure of the Thin Membrane.*—This is shown at "*a*," in Figure 7, and will be observed to consists of a mass of angular cells, filled with oil, and much resembling the similar cells shown in the illustrations of genuine coffee, published in No. 3 of the Journal. This membrane is usually of a brilliant dark golden colour, and the edges of the cells appear to stand out somewhat from the rest of the structure.

2. *The Structure of the Lobes.*—These consist entirely of ovate cells, filled with innumerable starch granules. The starch corpuscles are very small, and generally rounded, but no distinctive markings can be seen upon them, except by the highest powers of a very fine instrument, and even then, it is only on some of the granules that a spot or *hilum* can be observed. These cells of starch are also somewhat coloured, and are shown at "*b*," Figure 7.

3. *The Structure of the Embryo.*—This is seen at "*c*," Figure 7, and consists of broken and irregular tissues of cells, but which have a characteristic appearance. They are usually of a more delicate colour than the other structures, and frequently exhibit a most beautiful pink tint.

The most abundant of all these forms are the starch cells; but all of them ought to be present in a good sample. The chief use to which the microscope can be applied, besides that of proving the

existence or otherwise of cocoa in the sample, as above described, is the detection of starch which has been added as an adulteration. In Figures 5 and 6 we show samples of cocoa adulterated with common arrowroot, and also with sago flour. It will be observed that the starch granules of these substances are very much larger than those of cocoa, and at the same time exceedingly characteristic in shape. A short study of the drawings will render their forms familiar to our readers; but we reserve any detailed description of them for our article on the starches.

To examine any sample of cocoa, it is only necessary to mount a few grains on a glass slide with water in the usual way (see our article in No. 4 of the Journal), and look at it with a ½-inch power and "A" eye-piece. Masses of red colouring matter, such as ochre, etc., can be easily detected by the microscope; but for the detection of sugar, it is best to employ the process of solution already described. Half an ounce of good cocoa, stirred up in a pint of water, allowed to settle, collected on a piece of blotting paper, dried at a low heat, and weighed, should not lose more than 50 grains at the very most.

We cannot leave this subject without a word in favour of the excellent idea lately introduced by a few of the leading firms, namely, that of selling pure cocoa very finely ground and deprived to a considerable extent of its oil. As we have already pointed out, the richness of cocoa was a bar to its use by dyspeptic persons, and had thus led to some authorities even approving of the "skilful chemical adjustment," or in plainer language, the "diluting and adulterating it with starch and sugar." But we most decidedly hold that this admixture is not a chemical adjustment at all, as it is simply replacing one carbonaceous matter by another, and, by so doing, diluting the whole substance, and thus materially reducing the percentage of the important nitrogenous constituents of the cocoa. The most sensible way is undoubtedly to express a portion of the fat, and thus to leave an article in which all the remaining constituents are not only retained, but their percentage increased in a high degree. We would therefore counsel our readers to prefer, in every case, a cocoa thus prepared; as, if an increased proportion of fat is desirable, it can be easily attained by making their beverage with milk instead of water. These preparations have also the advantage of real cheapness, because a much smaller quantity may be used to make a cup of cocoa than with an ordinary starched and sugared article, especially if the substance be boiled for a minute or two to extract more thoroughly the soluble portions. We gave last month a comparison, on Dr. Johnston's authority, of cocoa and milk,

which we now repeat with the addition of a column for cocoa prepared in this manner:—

	Cocoa Nibs.	Dried Milk.	Cocoa Essence.
Fat	51	24	25½
Casein	21	35	31½
Sugar and starch	22	37	33½
Ash	4	4	6
Theobromine	2	0	3

So we thus see that the analogy to milk is rendered much more perfect by the process of fat extraction.

Since writing our last month's article, we have received a communication from one of our leading cocoa manufacturers, which shows that had our collectors purchased the lower priced cocoas, a much worse picture would have been presented. The firm in question says, "You can hardly be aware of the enormous quantity of cocoa that is retailed at 6*d*. per lb., in square red packets; in many of these cocoas you would not find one-fourth part of pure cocoa, the other three-fourths being composed of starch and sugar, though, generally, molasses are substituted for the latter. We need hardly say that we do not manufacture this article, believing, as we do, that to sell such an article for *cocoa*, or even as *prepared cocoa*, is monstrous." So thus we live and learn, and when we again advert to the subject of cocoa, we shall assuredly keep our eye on the 6*d*. red packets.

No. 5.—LARD.

LARD is the popular name given to the fat of the pig, after having been separated, by a process of melting, from the membranes in which it is enclosed. When the fat, technically called "flare," is sent to the manufacturer, it is usually slightly salted, and set aside to accumulate until a working quantity is collected. It is then cut into small pieces, and placed in a boiler fitted with a steam jacket, so that a proper heat can be produced without the risk of burning. Under the influence of heat, the fat melts, and separates from its membranes, which rise to the surface, and are skimmed off. When all the separable matter has thus been removed, the melted product is run into small barrels or bladders, the latter mode of collection being used for the best portions only.

Pure lard is a compound of stearin and olein. It ought to yield, when melted, a perfectly colourless oil; and should, when cold, be white, firm, tasteless, and almost inodorous. It should not boil at 100° centigrade, nor should it yield any solid matter as a deposit or as a scum. If, however, we are to believe the former writers on adulteration, lard very seldom presents this blameless appearance,

as it has been stated that water, alum, lime, and salt, are all employed for the purposes of sophistication. Dr. Calvert wrote in the "Pharmaceutical Journal," in February, 1863, on this subject, as follows:—"During the numerous analyses I made some three years since of various articles of food employed in public establishments, I analysed several samples of American lard, and therefore may add to the fact already mentioned by Mr. George Whipple, in your last number, that I found them to contain, in addition to starch, from 10 to 12 per cent. of water, and from 2 to 3 per cent. of alum, and 1 per cent. of quicklime. A few months ago I was able to ascertain that the operation is conducted in the following manner:—The fatty matters, such as they arrive from America, are melted with a little water, in false-bottomed copper pans, through which circulates a current of steam. The dirt and other heterogeneous matters fall to the bottom of the pans, and the clear grease is allowed to run off into a wooden vessel, when it is stirred in contact with cold water; it is then put under revolving wheels, with a thick paste made of potato starch mixed with a little potash, alum, and quicklime, which appears to facilitate the taking up of the water and starch by the fatty matter. The cause of the American lard appearing so white is, no doubt, the division of the fatty matter through the interposition of the starch, water, and alumina. The quantity of alum should be such, that a small excess should remain to prevent the starch from becoming mildewed; and I believe that the manufacturer also adds it for the purpose of communicating to the lard the property of facilitating the raising and increasing the whiteness of the confectioners' paste, in which it is largely employed." It has also been said that it is a common thing to add a little mutton suet to lard, for the sake of communicating consistency.

Let us now endeavour to find the state of the lard at present sold by our tradesmen, and, as the simplest way to doso, we will glance at the analyses of 28 samples of that article purchased in London:—

No.	Price.	Adulterations.
1	1/-	Water 13 per cent.
2	1/-	None.
3	1/-	,,
4	1/-	,,
5	-/10	,,
6	1/-	,,
7	1/-	,,
8	1/-	,,
9	-/10	Water 14 per cent.
10	1/-	None.
11	1/-	,,
12	1/-	,,
13	1/-	Water 20 per cent.
14	1/-	None.
15	1/-	None.
16	-/10	Water 16 per cent.
17	1/-	,, 22 ,,
18	1/-	,, 10 ,,
19	1/-	None.
20	-/11	,,
21	1/-	,,
22	-/10	,,
23	1/-	,,
24	1/-	,,
25	-/10	Water 12 per cent.
26	1/-	None.
27	-/11	,,
28	1/	Water 15 per cent.

Thus we see that out of twenty-eight samples, eight only were adulterated. This is perhaps a more refreshing picture than that presented by any article of food we have yet examined, and shows an improvement since former investigations of a like nature. In those cases, however, where water has been used, it has not been put in with a sparing hand—indeed, in several of the samples noted, the water ran freely out upon the slightest touch. No adulteration other than water was detected, but even *this* is bad enough, seeing that it not only causes spurting in the frying-pan, an occurrence which always annoys our cooks, but is also a robbery of our pockets, as the following table plainly shows, pure lard being taken as worth 1*s.* per lb.:—

No.	Price.					
1	1/-	Really worth only			10½*d.*	per lb.
13	1/-	,,	,,	,,	9½*d.*	,,
16	-/10	,,	,,	,,	9½*d.*	,,
17	1/-	,,	,,	,,	9½*d.*	,,
18	1/-	,,	,,	,,	10½*d.*	,,
28	1/-	,,	,,	,,	9½*d.*	,,

Nos. 9 and 25 are reduced to the value at which they are sold.

We now come to the detection of adulteration in lard, and the most popular method that we can give is as follows:—Take a small wide-mouthed bottle, and fill it with the lard to be tried, using as little pressure as possible during the operation. Now place it in a basin of boiling water, and let it stand in a warm place for half-an-hour. At the end of that time it should exhibit no stratum of water at the bottom, nor should any portion be only semi-transparent. The height of the layer of water will form a clue to the quantity which has been added, whilst any white matter at the bottom shows one of the other adulterations. Although we have not detected any starch in the samples tried, yet we have deemed it advisable to give illustrated directions for its detection, as it has been previously found by other observers. There are two ways of examining lard microscopically for starch, but we think the following is the most striking:—Place a piece of lard on a slip of glass, and, by means of a penknife, thoroughly incorporate with it a drop of tincture of iodine. If starch be present a blue colour will be developed, and, to make quite sure, a small portion of the iodized sample is to be spread out on a glass slide in as thin a stratum as possible. This is best accomplished by pressure upon the covering glass, after it has been dropped on (See Article in No. 3). The object thus mounted should then be viewed by a ¼-in. power and "A" eye-piece, when starch granules will be seen beautifully coloured by the iodine as represented in Figure 8, and imbedded in the crystalline looking

mass of lard. Salt, alum, and the other adulterations are best discovered by burning away the lard and examining the residue in the manner that we shall fully explain in our article on flour and bread.

This lard investigation forms a good text for those who object to the Adulterations Bill, now before Parliament, which professes to deal with hurtful sophistications only, and those inimical to health. Here we have an admixture which cannot be thus characterised; and so, although it is a palpable fraud upon the public, we are not to be protected from such a proceeding on the part of our tradesmen! Is this throwing of a bone to Cerberus a praiseworthy proceeding on the part of the members of the people's Parliament?

J. Muter, Ph.D.

[We have been requested by Mr. W. H. Lee, of Holborn Hill, to repeat our analysis of his cocoa, with his name attached, in accordance with the editorial note at end of the "Popular Food Analysis," in last month's Journal.

Analysis of W. H. Lee's Sample (No. 21.)

Moisture	5·1
Soluble in ether (fat)	48·2
Soluble in cold water (sugar, etc.)	11·8
Soluble in acid (starch, etc.)	18·0
Insoluble (cellulose, etc.)	16·7
Colour of ash	Grey.
Nature of chief foreign starch, by microscope	None.

This is an excellent and pure cocoa, and deserves to be the more commended, inasmuch as it is manufactured specially by the retailer himself.—Ed.]

Peas.—"Green Peas! Green Peas!!" Delightful sound to a gourmand's ear; one that he would rather listen to than the most exquisite notes that Patti could produce, or the sweetest song that Miss Edith Wynne could warble. "In effect, how could one be insensible, on such an occasion as the appearance of the tenderest, the best, the most delicate of vegetables?—of a vegetable which procures all Paris four consecutive months of untold enjoyment, which allies itself with every species of meat and of fowl, and which alone and by itself may be considered as a prince of *entremets?* It would require more than a quarto volume to enumerate the different methods of preparing green peas. They are served *à la crême, à la demi bourgeoise, à la flamande, à la Rambouillet*, with bacon, in various kinds of soups, and *purées* of infinite variety. They are placed under *tendons de veau*, under giblets, under cutlets of every description, fricassées, etc., etc. In fact, there is not an animal on the earth or in the skies, which does not feel itself honoured in being allied to green peas."—*Almanach des Gourmands.*

AFRICAN FOODS.

No. 1.—The Hippopotamus.

The flesh of the hippopotamus is well esteemed, and the meat does not taste unlike beef, according to Du Chaillu, who considers it rather coarse grained, and not fat, but a welcome and wholesome dish. The blacks are very fond of it; but we think we should have heard more of its virtues from the travellers and explorers in Africa, if they had liked it equally well. They almost all pass it *sub silentio*.

We have, however, in this matter, the advantage of being able to refer to the opinion of some who have tasted hippopotamus flesh in London, and who have been able to bring it to the test of a more normal appetite, than those who may have dined on it in its native haunts. A fine young specimen, which was exhibited in the Crystal Palace, was roasted alive when the eastern wing of that building was burned. We remember paying a visit to the ruins the morning after the fire, and a policeman pointing out to us among the chaotic heap of twisted iron pipes, burned bricks, and broken glass, a black, leathery-looking, charred mass. This was the hippopotamus, which, upon being more closely examined, did not at all appear so distasteful a morsel as at a first glance. True, the skin was leathery and charred; but it had split in places like crackling, exposing a beautifully delicate white meat or fat underneath. We made some proposition for acquiring the specimen, both for *gourmandise* and science, but Dr. Crisp was more prompt, and secured it before us, and he has given an account of his dissection of it in the "Proceedings of the Zoological Society" (1867, p. 601). He there tells us that one side of the animal was well roasted, and that he supplied some of his friends with the meat thus cooked—gipsy fashion—and partook of it several times himself. He reports the flavour as excellent, and the colour of the flesh whiter than that of any veal that he ever saw. The fat lay under the skin as in the hog, and not in the interior, as in the elephant; it was about 1½ inches in thickness. This fat is much esteemed by the inhabitants of south-east Africa, and is salted and preserved, under the name of Sea-Cow's-Speck.

A. Murray, F.L.S.

NEW BREAD.

Why is it that, in this highly-favoured isle, we must refrain from eating new bread, as if it were poison; unless, indeed, one happens to possess the stomach of an ostrich and the constitution of a rhinoceros?

Everyone knows how palatable is the steaming loaf fresh from the bakehouse, and we can all remember with what eager eyes we regarded as schoolboys the new half-quartern, as it stood in its unshapely modesty, wreathed in vapour, in the cupboard. Which of us, during his melancholy days of satchel and Latin-root-hood, has not eyed the forbidden morsel with an eager craving out of all proportion to its merits?—a craving which seemed to develop and increase as our loved and venerated mother assured us that new bread was decidedly unwholesome for little boys. And when a crummy slice from a two days old loaf was placed in our unwilling hands, smeared and diagramed as it usually was with treacle or other saccharine decoy, and we were told how good it was for us,—but for the treacle, how odious it seemed! Probably this repugnance was strengthened when we recollected how many other unpalatable circumstances were daily happening,—all for our good. We were hurried to bed at the most objectionable hours; we were reminded in the morning of the sluggard, his complaining voice, and his unhappy end; we were soaped, scrubbed, bolussed, and birched,—all for our good; so that, schoolboy-like, we sometimes longed to make a surreptitious trial of the bad, by way of a change. Nevertheless, as a rule, our watchful parents and maiden aunts almost invariably succeeded in defeating our cunningly contrived schemes, especially those having for their object the consumption of new bread.

Now, why is new bread unwholesome, or rather, how does it happen, that its alleged unwholesomeness is only experienced here? In Paris or Vienna even the most dyspeptic eat, with a feeling of perfect safety, the exquisite new bread, which is usually baked three times a day and served fresh with each meal. So far from the cry being raised, as in London, "Waiter, some stale bread," the *garçon* who dared, either accidentally, through hygienic belief, or from motives of economy, to fetch yesterday's rolls, would have to run the denunciatory gauntlet of the table, and make certain of retiring

copperless at the hands of the diners, even if no worse fate overtook him. Can it be that our climate is inimical to the production of bread in the highest state of perfection—that our flour is inferior to, or our bakers less skilful than theirs? Something is evidently wrong, so it may be interesting to look into the chemistry of bread-making here, previously to describing how they manage the production of the staff of life in the south of sunny Spain.

When wheat is ground and sifted, it gets divided into bran and flour. The bran is the outer coating of the grain, which resists the crushing of the mill-stones longer than the interior, but when reduced sufficiently to pass through the sieves, so darkens the colour of the whole as to render it inferior in market value, although really superior in nutritive qualities to the white flour alone. For the former reason it is generally sifted out, and in England sold for fattening farm stock. The flour consists of the interior. If pure flour be mingled with a sufficiency of water to moisten it, a little yeast and salt added, and the mass kneaded thoroughly together, then placed in a warm atmosphere, it ferments and increases in bulk. Carbonic acid gas is disengaged in the substance of the dough, which speedily becomes cellular. Placed in a hot oven, the swelling increases until the mass has nearly reached 212° Fahr., when fermentation is arrested, the bread retaining the shape it has then assumed. This fermentation is the result of the chemical action which yeast exercises upon moist flour, in changing a portion of the starch into sugar, and then converting the latter into alcohol and carbonic acid. The dough being glutinous and highly elastic, the gas cannot escape, so the mass swells and increases until, the heat killing the yeast plant, further evolution of gas ceases, while the alcohol evaporates and is lost in the oven.

But flour contains other nitrogenous substances than gluten, and others non-nitrogenised, besides sugar. Such substances readily undergo transformation, acting in turn as ferments, converting the starch into dextrine and sugar, and occasionally into lactic acid. When dry flour has been, through any accident or carelessness, exposed to heat and moisture, the albumen it contains passes into this peculiar condition, and is incapable of yielding good bread; because, during the manufacture, the conversion of starch into dextrine and sugar, which always happens in a limited degree, then occurs on a large scale. The bread produced is sure to be saccharine and sodden, being destitute of lightness, porosity, or cellular division; besides having acquired a dark and objectionable colour, owing to the presence of diastase, should there have been a slight admixture of bran. In order to counteract the injurious action of

diastase, alum is sometimes employed, which enables those of our bakers who are unscrupulous to use many qualities of inferior flour, which, they excuse themselves by saying, would otherwise be wasted. "That alum is not necessary," says Dr. Ure, "for giving bread its utmost beauty, sponginess, and agreeable taste, is undoubted, since the bread baked at a very extensive establishment near Glasgow, in which about 20 tons of flour are regularly converted into loaves in the course of a week, unites every quality of appearance with absolute freedom from that acido-astringent drug."

In the large and well-known bakery just alluded to, situated in the village of Crossmyloof, not far from the scene of Queen Mary's final defeat and flight, the following is the usual routine, as furnished to the writer by the obliging manager, Mr. Dalgetty:— The contents of a sack of flour, weighing 280 lbs., are mingled with 18 gallons of water, to which half a gallon of yeast and 4 lbs. of salt have been added. After the usual fermentation and kneading, the dough reaches the manipulating workmen, who are distributed in groups of five, *i.e.*, two men to each table, and one man and two tables to supply each oven. By this arrangement the work is so apportioned and distributed that no loss of time occurs, and no undue pressure lights on any one individual. The result per sack is from 90 to 92 four-pound loaves

Some idea of the extent of business transacted at this establishment may be gathered from the fact that, during the week ending 26th February, 1870, 792 sacks, containing 99 tons of flour, produced 71,283 loaves; and in addition, over 4½ tons of similar flour were converted into fancy biscuits, buns, etc. Evidently there has been a vast increase both in the manufacturing power of the bakery, and in the well-deserved public favour extended to its produce, since Dr. Ure wrote some few years ago.

The dyspepsia, so frequently complained of after eating some descriptions of bread, whether new or old, may easily be accounted for, if many of our English bakers use similar flour to that supplied in 1850 by a fraudulent miller in Staffordshire. A gentleman, who was in the habit of visiting Newcastle-under-Lyne, found himself invariably seized with pain in the stomach whenever he took his meals there. Suspecting the bread, he caused an analysis to be made, when sulphate of lime was detected in considerable quantity. The baker asserted his innocence; but a search of the miller's premises having revealed a large quantity of plaster of Paris, he was tried, convicted, and heavily fined.

Without entering on the discussion of the question as to what the effects of the habitual use of alumed bread on the digestive

organs may be, it is sufficient for our present purpose to note the fact that, as a rule, our English bread has too much yeast introduced into it, undergoes too little kneading, and that, by the aid of a mineral substance, inferior, or even damaged flour, may be made to do duty in bread-making as if it had been sound and of prime quality.

About six miles from Seville is situated the pretty and highly picturesque village of Alcalà de Guadaira, which supplies the City of Oranges with bread. Let us halt for a brief period at the house of our worthy friend Panaderos, and watch the preparation of that delightful compound, which every traveller in the south of Spain has remarked as being so pleasant to the eye, so agreeable to the taste, and nourishing to the system. His wife and daughters are seated on low benches in the porch, sorting the wheat, which they separate both carefully and with expedition, consigning every objectionable grain to a basket reserved for the purpose. Singing some musical old ballad, and laughing merrily as they continue their light and pleasant employment; their lustrous eyes, blushing cheeks, pearly teeth, neatly braided hair, scrupulously clean small hands, and bright fanciful attire, remind one of the pretty little tea-pickers of China, warbling their favourite Moh-li-Hwa or Jasmin Flower amidst their heaps of Congou.

When ready, the wheat is passed through a mill on the premises, driven by a blindfolded mule, having a string of bells attached to its neck, which keep up a monotonous tinkling so long as it paces its round; and when it stops to rest, it is again set in motion by the cry, "arre, mula." The whole arrangement is as primitive, simple, and unpretending as that in use, according to the delineations on Egyptian sculptures, two thousand years ago. The resulting flour is passed through three sieves of different degrees of fineness, the wires of the last being so close together that only the pure flour is sifted through.

Evening is the time for bread making at Alcalà de Guadaira, when the female portion of the community may be seen in their own houses making dough, into which, in contradistinction to our method, only a minute quantity of leaven is introduced. "A little leaven leaveneth the whole lump," we are taught in Scripture; here it is practised,—whereas at home, in order to avoid the labour of kneading, which it must be admitted is very severe, many of our bakers, where carbonic acid machinery is not employed, use as much yeast for one batch of bread as those simple people consume in a week. The dough, being ready, is placed in bags, and conveyed on

the backs of mules to the great village oven, which is conveniently situated so as to accommodate the thrifty house-wives around. It is there divided into three-pound lumps, which are tossed on a long narrow table. These are immediately seized by a multitude of sturdy brown bakers, who knead each portion with all their strength for about four minutes, passing it on from one to another, until it has gone under the knuckles of all. Here again the process is similar to that of preparing tea, and reminds one strongly of the long rows of stalwart manipulators seen in the tea districts of China, making the fragrant leaf ready for market.

Such is the energy which those *panaderos* infuse into their work, that in course of time the palms of their hands, and the second joints of their fingers, bristle with corns; and the guttural "aha, aha," uttered by them as they thump and squeeze the yielding, gratefully smelling billows, is suggestive of the exclamations breathed by the hard working tea-bearers among the mountain defiles of Hounan and Oopack, as they trot down with their precious burdens to the various shipping ports.

Immediately on leaving the kneading table, where the lumps have, as a final process, been shaped into loaves, they are transferred to the oven. It is heated with wood, mingled with twigs of sweet marjoram and thyme, vast quantities of which cover the adjoining hill slopes, scenting the air with their rich perfume. There being no fire under the oven, the bread is never burned, the hottest period being when the loaves are introduced, which, being full of moisture, quickly acquire a crust that protects the crumb.

In this primitive Spanish village it is evident that an answer to our inquiries has been found in the simple words—pure flour, little yeast, much kneading.

William Cochran.

The Oxford magistrates have at length taken proceedings against the bakers of that union, and we trust that a similar attention will be paid to the bakers and purveyors of other unions throughout the kingdom. The paupers of the Oxford Union are habitually supplied with loaves of short weight, one baker—a Mr. Giles, of Headington—having delivered seventy-nine deficient loaves out of 102. It seems that a short weight of 4 ozs. and 6 ozs. in a quartern loaf is the rule and not the exception, although some bakers declare that they make up the requirement by an occasional surplus. *Credat Judæus.* We do not hesitate to say that in many unions systematic robbery is carried on in other things besides bread; and every guardian *ex officio* ought to make it a point of honour to examine the working of each contract thoroughly, both as to quality and quantity.

THE MONKS OF OLD.

It is somewhat singular that, considering the extreme interest of the subject of living, which includes eating, drinking, and all the social customs connected with these necessary rites, so few works have ever been written on its history. It is true that historians have occasionally alluded to it—while antiquaries, such as Stow, Strutt, Holinshed, or Fitzstephen, have given us graphic accounts of the various periods of English life—and writers on the economic state of the country, like Sir Richard Eden, have devoted some of their pages to the condition of the people in household matters. Perhaps it may be said, that it is beneath an historian to do more than casually introduce these things; otherwise, a word painter, like Macaulay, might have given us a most deeply interesting picture of England, viewed entirely from a home aspect.

I propose to jot down from time to time some of the most curious points as to the housekeeping of our ancestors, for, although we cannot expect to learn much from it, a retrospective comparison with that of the present day cannot but be suggestive. In the simple question of manners, I doubt whether any of my readers would wish the good old times to come back, when

> If the dyshe be pleasaunte, eyther fleshe or fyshe,
> Ten handes at once swarme in the dyshe;
> And if it be fleshe, ten knyves shalt thou see
> Mangling the fleshe, and in the platter flee.
> To put then thy handes in perill without fayll
> Without a gauntlet, or else a glove of mayll.

In this article I shall limit myself to a description of some of the ecclesiastical establishments of mediæval England. After all, the abbots and ecclesiastics generally were the great cooks and bonvivants of the age, which may be said to have cut two ways; for whilst, in those days of semi-barbarism, good cooking, with its accompanying niceties of service and decoration, without doubt contributed much to the refinement of manners and the cultivation of good taste,—on the other hand, it brought in its train such gluttony, voluptuousness, sensuality, and general irregularity of conduct, that the religious houses were at once an admiration and a scandal. The latter, however, so far predominated, that it was one of the causes that conduced to the dissolution of the monastic system by Henry VIII.

We can scarcely blame the monks for running riot, if we examine their lives, of which indolence and inaction were the great characteristics. There was little or no scope for ingenuity of mind or activity of purpose outside their own walls, so that it was no wonder that their talents were concentrated on the petty routine of the house: the more, when we consider that by their very profession, hospitality was enjoined as a sacred duty; and thus the monastery or abbey became the *hospitium* of every traveller, the relieving office of every poor person, and the head-quarters of every jolly roysterer within twenty miles, who knew to a T how many fat carp the monks had in their fishponds, or how many quarts of sack the cellarer numbered on his list. Certain districts, indeed, were so productive of these calls upon their resources, that the finances of the abbey were sometimes seriously affected—as we read, that the monks of Sawley Abbey, on the Lancashire and Yorkshire border, were reduced to poverty (or said they were) in consequence of the hospitality that they were compelled to exhibit to the crowds of people who passed their gates. In consequence of this complaint, Maud, Countess of Warwick, granted to them 100 acres of land, which improved the condition of the abbey considerably. I suspect, however, that the monks of Sawley were at best a mean, churlish set of individuals; for when, a little later on, the Abbey of Whalley was founded some ten miles lower down the valley of the Ribble, they complained that the arrival of the intruders had so raised the price of provisions in the neighbourhood, that the Sawley monks could scarcely make a living.

Both these abbeys belonged to the Cistercian Order, an order which, at the earlier period of their establishment in England, was of a very strict *régime*, and notorious for the rigour of their fasts and the general abstemiousness of the members. But, as time went on, and the abbeys gradually amassed property, the abbots became powerful as princes in their respective districts, and ruled the roast magnificently in more senses than one. A poem, supposed to be coeval with the conquest, has been preserved, which satirises the good eating and drinking to be found within the sacred walls:—

Ther is a wel fair abbei
Of white monkes and of grei,
Ther beth[1] bowres and halles;
All of pastens, beth the walles
Of fleis, of fisse, and a rich met,
The likefullest that man mai et.
Fluren cakes beth the schingles[2] alle
Of church, cloister, bowres and halle;
The pinnes[3] beth fat podinges,
Rich met to princes and kynges.
Ther beth four willes[4] in the abbei
Of tracle and halwei,[5]
Of baume and eke piement.
Yet I do yow mo to witte,
The gees wrosted on the spitte
Fley to that abbei, God hit wot,
And gredith,[6] gees al hote!

[1]Are. [2]Tiles. [3]Pinnacles. [4]Fountains. [5]Ale. [6]Crieth.

Giraldus Cambrensis was terribly indignant with the monks of Canterbury and Winchester, who, as early as the time of Henry II., were noted for their *gourmanderie*. "Their table," says he, "consisted regularly of sixten covers or more of the most costly dainties, dressed with the most exquisite cookery, to provoke the appetite and please the taste. They had an excessive abundance of wine, particularly claret, of mulberry wine, of mead, and other strong liquors, the variety of which was so great in these repasts, that no place could be found for ale, though the best was made in England, and particularly in Kent." There is something exceedingly comic in the complaint that there was no room for ale, and one can fancy the contempt which the sturdy Welshman had for the bad taste of the churchmen.

The monks of St. Swithen, at Winchester, were bold enough to carry a protest to the feet of King Henry, eked out by many floods of tears, to the effect that their bishop, who was also their abbot, had taken away three of their dishes. The king enquired with great concern how many they had left, and on hearing that they had ten, declared with a round oath that *he* was contented with three, and therefore kicked out his gluttonous subjects, with a promise that in future their courses should be reduced to the same number.

With such gastronomic tendencies, no wonder that the old poet Longlands, in his "Vision of Piers Plowman," draws the picture of a friar in no very flattering terms—

> Than turned I apen whom I had all ytoted (observed),
> And fond in a freitore, a frere on a bench,
> A great chorl and a grym, growen as a tonne,
> With a face so fat, as a bagge honged.
> On bothen his chekes and his chyn, with a chol lollede
> So great a gos ey, growen al of grece.

And so on for several stanzas more, very much to the personal discredit of the subject.

That portion of the monasterial establishment which looked after the housekeeping, was by no means the least important. Head of it all, was the *Magister Coquinæ*, who acted as steward and general purveyor of the provisions, which were dressed by the *Coquinarius*, or cook. The *Cellerarius* looked after the liquor, the *Hospitalarius* after the strangers, while the *Refectionarius* managed the table-cloths and service, as well as the noisy host of under servants. That this latter official had no sinecure may be easily imagined, when we are told that upwards of ninety menials were lodged in Whalley Abbey, of whom about one half belonged to the personal establishment of the Abbot. Whalley Abbey, indeed, is an excellent

example of the style of living which prevailed in religious houses of those days. Other monasteries, such as those of Sempringham, in Lincolnshire, Beverley, in Yorkshire, and of the Knights Hospitallers, were specially famous for their luxury; but Whalley is the more interesting, because so many documents have been handed down to us relative to the expenses of the establishment. One of these, called the "coucher" book, gives us the most minute detail as to the daily supplies and their cost, and shows us what a quantity of animal food was consumed, notwithstanding the frequency of the appointed fast days. At the abbot's table alone were eaten annually 75 oxen, 80 sheep, 40 calves, 20 lambs, and four pigs, while the refectory and other tables in the house were supplied with 57 oxen, 40 sheep, 20 calves, and 10 lambs. In addition to this, an immense amount of venison disappeared in haunches, and pasties; together with game, waterfowl, and fish without end. The drink corresponded in quantity, and I daresay in quality also. In 1521, the abbot brewed 147 quarters of malt, and the consumption of red wine amounted to eight pipes a year, while of sweet wines no account was kept. There was no stint either of stores, which, though common enough with us, were then so rare and high-priced that even the nobility seldom saw them, and the gentry scarcely ever. These included figs, almonds, nuts, pepper, saffron, nutmegs, and sugar, which last, curiously enough, is mentioned for the first time in 1488, when fourteen pennyworth was bought for the use of the abbot.

In 1530, sugar was 7*d.* per lb., a price which, although it would not strike the attention ordinarily, was tremendous, when we take into consideration the relative value of other things. For instance, it is mentioned in "Gregson's Fragments," that as four dozen chickens cost only six shillings, a pound of sugar was worth nearly five chickens. The following is the roll list of provisions in stock at the Abbey on a certain day in 1341—and probably in Lent—to judge by the preponderance of fish:—ccccxxiv de duris piscibus (stock fish); xxviii de salmonibus; mmm de halicibus; i capula de fruct (probably one basket of dried fruit); viii petras de carcosiis bovum (ox carcases); ii de baconibus; xxiv petr de caseo (cheese); 1½ petr de butyro (butter); xlii lbs. de racemis (raisins); lx lbs. de amygdalis (almonds); mmm ceparum; i lazen, ol. ol. (olive oil); i lb. pip (pepper).

I will conclude the present article by a quaint story told by old Fuller, the church historian:—"King Henry VIII., as he was hunting in Windsor Forest, either casually lost, or perhaps wilfully losing himself, struck down about dinner time to the Abbey of

Reading, where, disguising himself (much for delight, more for discovery, to see, unseen), he was invited to the Abbot's table, and passed for one of the King's guard, a place to which the proportion of his person might properly entitle him. A sirloyne of beef was set before him, on which the King laid lustily, not disgracing one of that place, for whom he was mistaken. 'Well fare thy heart,' quoth the Abbot, 'and here in a cup of sack, I remember the health of his Grace your master. I would give an hundred pounds, on the condition I could feed so heartily on beef, as you doe. Alas! my weak and queazie stomach will hardly digest the wing of a small rabbit or chiken.' The King pleasantly pledged him, and heartily thanked him for his good cheer, and after dinner departed, as undiscovered as he came thither. Some weeks after, the Abbot was sent for by a pursuivant, brought up to London, clapt in the Tower, kept close prisoner, fed for a short time on bread and water; yet not so empty his body of food, as his mind was filled with fears, creating many suspicions to himself, when and how he had incurred the King's displeasure. At last, a sirloyne of beef was set before him, on which the Abbot fed as the farmer of his grange, and verified the proverb, that two hungry meales make the third a glutton. In springs King Henry out of a private lobbie, where he had placed himself, the invisible spectator of the Abbot's behaviour. 'My Lord,' quoth the King, 'presently deposit your hundred pounds in gold, or else no going home all the days of your life. I have been your physician, to cure you of your queazie stomach, and here, as I deserve, I demand my fee for the same.' The Abbot down with his dust, and glad he had escaped so, returned to Reading, as somewhat lighter in his purse, so much more merrie in heart than when he came thence."

Under such wholesome treatment as this, the ecclesiastics of that age could not, at all events, suffer much from gout, whatever else ailed them; and I know more than one reverend gentleman in the present day, to whom life is a burden, who would become young again by a little judicious starving. In a future article I shall endeavour to describe a few of the entertainments of the secular clergy, who were as fond of good living as the monks and abbots. Indeed, it is a curious fact that, even down to the present time, the clergy have always had a speciality for this kind of enjoyment. There is a story of a head waiter, who, on being consulted as to a clerical dinner party, requested to know to what religious division the guests belonged—explaining, by way of apology for the question, that the invariable rule for high church diners was "more wine," but for evangelicals, "more wittles."

PHILLIPS BEVAN.

OUR FARINACEOUS FOOD SUPPLIES.

The subject of food supplies forces itself on the attention of every head of a family; and the question is often a difficult one, even with those who are far from being of the poorest class, How to procure good and cheap food in abundance? It is a question, therefore, of national importance, affecting the welfare of multitudes and the general prosperity of the country. Let us endeavour to take a rapid survey of our food supplies, directing attention at present more particularly to that important part of them—our supplies of farinaceous food—and to note the possibility or probability of their increase.

Our food is derived partly from the land and partly from the water,—chiefly from the former, although to no inconsiderable extent from the latter. It is the produce entirely of the animal and vegetable kingdoms. The eating of mineral substances, of which we sometimes read, is generally to be ascribed either to a morbid craving, or to the necessity of filling up the void in the stomach, when a sufficient supply of proper food cannot be obtained. In the rare cases in which substances usually regarded as mineral seem in some degree to possess nutritive properties,—as the *Bergmehl* of Norway,—they owe their origin to the animal kingdom; a small store preserved through uncounted ages, but of very little value. Water is the only inorganic substance which can ordinarily be taken with advantage into the stomach, and great as is its importance, it is not properly to be regarded as an article of food.

Looking to the fact that our food supplies are mostly derived from the land, the possible improvement of the soil by further cultivation presents itself to us as the natural means of their greatest increase; and an increased productiveness of the soil of our own country is of greater benefit to us than any increased productiveness abroad, whatever facilities of importation we may enjoy. Britain, without cultivation, could only support a few tribes of wandering savages. Almost all that we derive from the land, whether of vegetable or of animal food, is due to the cultivation of the soil. Ancient as is the art of agriculture, it seems to be still only in its infancy; though never, since the spade or plough was invented, did it make such progress as in recent years. Even yet, however, it is evident to every one at all acquainted with the subject, that much

remains to be done. There is a great extent of land in the United Kingdom capable of improvement and vastly increased productiveness, if this may not even be said of our best cultivated and most productive fields. The effects of liming, furrow-draining, and guano have been such as any one would have been laughed at for predicting within the memory of persons not yet old. There are large districts in which it has been very partial, and in which agriculture has remained almost stationary, farmers being contented to follow the footsteps of their fathers. Into the causes of this we cannot at present stay to enquire; the fact is enough for our notice. As to the reclaiming of bogs and fens, it has been only partially accomplished or even attempted; we have no doubt, however, that Chatmoss will yet become one of the most fertile districts of England, and the Bog of Allen one of the best corn-producing tracts of Ireland.

Few seem to think of the prodigious waste of land by hedges. Hedges are sometimes useful for shelter, and sometimes for ornament; but many of our hedges are neither the one nor the other. They are intended merely as fences; but they are the most expensive of all fences. They are not the mere lines, having length without breadth, which they appear on the plan of an estate. The best trimmed hedge consumes at least 3 ft. of land on each side of it, and many of our English hedges are far from being well trimmed. On the contrary, there seems to be a pride in allowing them to grow in wild luxuriance, exceedingly beautiful, no doubt, in the time of hawthorn blossom, and rich in food for birds during winter; whilst the roses on both sides of them delight the eye in summer, and the brambles yield more fruit than all the children of the neighbourhood can gather in autumn,—hawthorn, roses, and brambles taking up, however, a large extent of valuable land. In many places old hedges may be seen, tall and large, which have ceased to serve the purpose of fences, and terminate sometimes in the midst of a field. All this is mere wanton waste. If it were possible to make a calculation of the arable land consumed by useless hedges in Britain, the result would certainly be a number of square miles not less than a whole county of moderate size. The case is still worse, where there are numerous hedge-rows. Hedge-rows are often highly ornamental; and where this is the case, we should be sorry to see them cut down; but many of the level landscapes of England are spoiled by their superabundance, hiding all but the nearest fields, and presenting the semblance of a forest.

What are we doing with the sewage of our towns? It is still too generally poured into our rivers, polluting them so as to destroy the

fish; destroying also the amenity, and impairing the healthfulness of their banks. There cannot too soon be an end of this. Whatever is to be done with the sewage, it must not be poured into the rivers; and, by its application to land, we might increase the natural fertility of the soil, and save the cost of much guano. Our whole system of sewage requires revision. The large quantity of water, often procured with difficulty, sent down our sewage pipes, makes it difficult to turn the discharge from them to any account; whilst in the pipes themselves decomposition takes place, so that what flows from them is greatly diminished in value, and deleterious gases ascend and escape into our streets, or into the houses situated in the highest parts of towns, which are thus rendered unhealthy, notwithstanding their otherwise favourable situation. It may be doubted if Mr. Moule's earth closets are to take the place of our water closets; but some change is necessary, for the present system of water closets, besides many other disadvantages, is very wasteful. We must learn to economise, like the Chinese, all that can be made available for the increase of the productiveness of the soil; and it is not unreasonable to hope that we may yet find out how to do this, whilst at the same time our houses and our towns are brought into a better sanitary condition than hitherto.

The facility of transport afforded by railways has contributed much, and seems likely to contribute much more, to the increase of the agricultural yield of this country, not only by the more ready market afforded for produce of every kind, but chiefly by the conveyance of lime and other manures to districts, to which they could not be profitably brought by cartage. Along almost all our lines of railway, there has been a rapid improvement of agriculture, and a great increase of produce.

Commerce has done much to increase our supplies of food, and no assignable limit appears to the prospect of future advantage from this source. Employed as the people of this country are, to so large an extent, in manufactures and in mining, it is not to be supposed that the soil of the country itself can fully supply their wants. Whilst our industries, however, yield the money requisite for the purchase of food, there is no reason to doubt that we can obtain it. The famine in Ireland, in the terrible winter of 1846-47, was not owing to the want of food supplies in the world, nor even to the impossibility of bringing them in good time from abroad; but rather to the want of money, on the part of those who needed the food, to stimulate commercial enterprise. So it was also in the late famine in Orissa. There was plenty of food in other parts of India, but the people of Orissa had no means of procuring it.

Foreign countries are capable of affording us far greater supplies of food than we have yet derived from them; and our money devoted to the purchase of it would not only serve a good purpose by stimulating commerce, but would promote the prosperity of the countries from which our supplies were derived. The more varied these supplies are, and the more numerous their sources, the greater security have we for abundance at all times. A bad season in the south-east of Europe, from which we import much corn, may be compensated for by a good season in North America; and, even if all our ordinary corn supplies were partially to fail in any particular year, we might still have recourse to other quarters, if we were contented to accept other kinds of food, instead of the wheat on which we have been accustomed chiefly to depend.

There is one kind of grain—maize, or Indian corn—of which we use little in this country, but which, for cheapness and abundance, is unrivalled. North America produces great quantities of maize, and the produce there would be vastly increased in a few years, if there were much demand for it for exportation. It might also be obtained in any desirable quantity from many other parts of the world, as it succeeds well, both within the tropics and in temperate climates, wherever the summer is a little warmer and longer than that of the South of England. Cobbett's attempt to introduce its cultivation in England was a failure, because of the unsuitable climate; but it deserves all the praise that he bestowed on it, for its excellent qualities and its great productiveness, which is many-fold greater than that of wheat, whilst its cultivation is also much more easy. We cannot wonder, then, that it is the common *corn* of American farmers, and that its cultivation has rapidly extended in parts of the world into which it has recently been introduced, so that it has largely taken the place of rice in some parts of Asia, and has even found its way far into the interior of Africa. It seems wonderful, however, that so little Indian corn has hitherto been imported into this country. An excellent article, known as Indian corn flour—"Maizena"—a comparatively cheap substitute for arrow-root, etc., has indeed, of late, become common in our shops; it is not really meal or flour of Indian corn, but a preparation from maize grown in America; and, although not intended to serve as a staple diet, is likely to become an important supplementary article of food. During the Irish famine, cargoes of Indian corn meal were imported, but the prejudice against it among the starving peasantry was so strong, that they seemed to feel as if their misery was insulted by the offer of it. Gradually and slowly this prejudice was overcome, and we believe that the principal consumers of Indian corn meal in

England and Scotland are now the Irish of the humblest class. There is good cause to regret that its value is not more generally appreciated in this country. Settlers in America soon learn to like it well enough; and so, after a little trial, would the people here. Good service might be done by the extensive circulation of a brief notice of the modes of preparing it.*

Exuberant as is the fertility of many tropical regions, it is wonderful how little we are indebted to them for any of the chief articles of food. We, indeed, import from them all the sugar which we use, and considerable quantities of some kinds of starch, as sago and tapioca, of which the supply might readily increase to meet any imaginable demand. But we are not indebted to them for any kind of farinaceous food, except rice, which we import from the East Indies. For any other valuable grain, except maize, a tropical climate is unsuitable. It does not follow, however, that there is nothing else which might be imported with advantage as a substitute for our ordinary bread-stuffs. In many parts of South America, the ordinary food of the people consists, in a great measure, of what is called in Brazil, *farinha*, which is the large fleshy root of the cassava or mandioc plant, dried and powdered, after the juice has been expressed. It is wholesome and palatable, and, if wanted for exportation, could easily be procured in great abundance, the cultivation of the plant being very easy. Tapioca is the starch of this root, prepared in a peculiar manner; but in nutritive value and fitness to serve as a principal article of food, it bears about the same relation to farinha that the potato starch does to the potato itself. It seems worthy of consideration, whether an attempt should not be made to introduce the South American farinha into our markets.

The possibility of importing the fruit of the plantain also deserves consideration. It is a common substitute for bread in the West Indies, and might probably be brought to this country in a perfectly fresh state, being less liable to suffer injury during the voyage than succulent fruits. The productiveness of the plantain far exceeds that of any other plant cultivated for the supply of food to man; and, if the possibility of importing the fruit in good condition could be established, there would be a new stimulus given to industry, and a new source of wealth to the West Indies, whilst we should know how to procure at any time, abundance of good and cheap food.

JOHN MONTGOMERY.

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* [The reader will find in the March number, page 104, some excellent recipes for preparing Indian meal.—ED.]

LONDON DINNERS.

PART III.

We left our reader last month at the corner of Leicester Square, after having essayed some of the various modes of dining there presented. Of the results there and elsewhere obtained, the experiences are only notable as suggesting possibilities. Our *corpus vile* has endured the experiments; what have we learned therefrom? We have already animadverted on the peculiarities, reprehensible as they are, of London dining-rooms in respect of soup and cheese. We now ask why do not the well-established houses consult the variety of tastes more? "The unvarying round, the common task," by no means "furnishes all we ought to ask." The guest will not consume more in quantity if a tempting and wholesome variety be offered him, while some improvement might be introduced in the way of vegetables. One would almost think that London was some Great Eastern at sea, so miserable is the choice of succulent vegetables offered. That horrible food for cattle called "turnip greens," universally disgraces our cartes. Covent Garden, with its supply of new potatoes from Malta, at 3d. per lb., and asparagus from Nice, appears to be unknown to our eating-house proprietors; and the existence of seakale, kohl-rabi, maize, and the possibility of stewed celery, are, we imagine, idle tales. Cauliflower and spinach are charged as luxuries. Do they, *i.e.*, the proprietors, not know that a curious diner can discover for himself what can be purchased, and at what price? Slowly we see that preserved peas and French beans are making their way, and we hail it as a sign of improvement; but the Anglo-Saxon stomach, like the Anglo-Saxon mind, is remarkably slow in moving. May it be part of the mission of the "Food Journal" to stimulate the vegetarian energies, and save London diners from feeding like cows and Nebuchadnezzar through the long winter months, as if other garden-stuff were a domestic privilege forbidden to wanderers like ourselves.

Of fish, too, as an item in the cartes, we might say much. The curious idea that as an article of food it is a luxury, manifests itself by the high prices affixed. The rivalry of Columbia Market will, we hope, do a good deal to break down the Billingsgate monopoly; but to anyone who knows the market prices, the rates which pro-

prietors demand for ordinary fish are monstrous,—for turbot and salmon exorbitant,—while fresh-water fish, except eels, are unknown. The public taste, perhaps, needs cultivating,—and pisciculture is an art in which we are far behind the Chinese; but why a cut of salmon in May should be charged 2*s.* 6*d.*, and a small sole 1*s.*, is simply inscrutable. Mount's Bay may send up tons of mackerel, but a fish bought for 3*d.* is, when cooked, retailed for 10*d.*—and we bear it. Great is the patience of the public!

So pondering, we proceed westwards and northwards, passing, not without commendation, John o' Groat's House, in Rupert Street. It is old-fashioned, and rather dear, but it is solidly comfortable. The carte does not offer variety, but the meats are good, in quantity as well as quality, with attentive service. We have known this house for years, and approved of it for plain English fare. It calmly surveys the Solferino—it was there before it, and probably will survive it; it possesses the demerits as well as the merits of the plain and solid London dining-house, but, contrasted with others, the merits weigh the scale. Our thoughts in penning this are on another old-established house—The Albany.

Who knows not the Albany dining-rooms in Piccadilly? It has seen the Wellington rise and fall. When we visited it the other day, there came over us a visionary awe,—memory recalled dimly the time when, not yet emerged from school restraints, we dined there—first of remembered dining-rooms—and ordered our dinner with difficulty under the waiter's eye. Is it changed since then? We hardly think so. That dreary antique respectability out of which one tries in vain to evolve comfort, pervading many English houses, reigns supreme at the Albany. It was and always is sure of support; diners coeval with the institution fill its "pews," yet it is, after all, only a little better than, let us say, Upton's.

But on what other principle can be explained that acquiescence in mediocrity of viands and service which characterises the patrons of the Albany and its congeners, save that element in the English character, which must be called the "domestic?" The Englishman, out of his own or a friend's home, seems to take it for granted that he is not to be comfortable, especially in the way of food. Of the travelling miseries we were reminded forcibly by the attenuated cushions of the boxes of the Albany, which resembled second class seats in hardness; the proportions of the dishes, too, were attenuated. We added the expérience of others to our own on this point, and all agreed. Fish was high priced, there was little variety, while a quarter of an hour was spent in expectation. Soups were like many others, *ni prose ni vers*, and the quantity was oppres-

sive. Beef and mutton, rumpsteak pie, fowl, etc., made up the carte. The meats were of average quality, which in the case of the mutton was deteriorated by bad carving on the "veneering" system, so ruinous to the best southdown; but the steak pie was below the average. The liquors were not commendable, and it did not sound well to hear a tenant of the next box, a middle-aged and travelled man, say to the waiter, "I am not particular, but really you must take back this pint to be properly filled." Scant measures, in solids and liquids, are annoying, to say the least of it. The dinner is inexpensive, coming quite within the 2*s.* 6*d.* limit, but not inviting a return; the service is very ordinary, napkins are the exception and not the rule, and the waiting power is insufficient. The illusions of our boyhood, which thought it fine to dine at the Albany, have given place to the sadder experience of the man; and we wonder at the contented conservatism which prevents improvements by not imperatively demanding them. A visit in search of a traditionary quiet, but good dining-room in Jermyn Street, resulted only in the discovery of a large bar. Bacchus reigned supreme; a change of proprietary had closed the club-like dining-room. Disappointed in our search, we proceeded up Regent Street, passing the Café Royal, with its rockery and fishpond in the window; *en passant*, we may remark, that we have not tested a dinner in the dining-room upstairs, but we have eaten a tolerable cutlet in the brilliant saloon, which, apparently, is always well filled. The prices are very moderate; a glance at the carte, and the experience of others, would incline us to think that this restaurant is well managed, and deserves mention as a favourable specimen of its class and species, other individuals of which we have had occasion to condemn.

Further up Regent Street, a short turn into Glasshouse Street leads to the Maison Dorée. It has an appellation which is somewhat ambitious, and, perhaps, may frighten soberly-minded diners; but let us assure them that the proprietor has studied the British public, their wants and weaknesses, at the St. James's Hall Restaurant; and he has turned the knowledge acquired there to good account. At the early dinner, or luncheon time, he offers a good, hot, well-served déjeuner from the joint, with vegetables, etc., and a glass of malt, for 1*s.*; and is, as he deserves to be, well patronised. A house where the economical and gastronomic inclinations of early and late diners, and consumers of suppers, are distinctively and carefully studied, obtains from us a well-deserved commendation. The late dinner ascends from 2*s.* for a plain, good meal from the joint, to a choice at 3*s.* 6*d.*, and up to 10*s.* 6*d.*, from a judiciously arranged carte, *discrétion*—or indiscretion, as you may be minded; better chosen,

better kept, and better cooked saddle of mutton, in our experience, never followed an excellent course of fish. The quiet, well-arranged dining-room was a worthy theatre for so well-served and enjoyable a dinner, and the unobtrusive but most sedulous attention of the waiters left nothing to be desired. The *chef* is an importation from the Parisian Maison Dorée, and his skill is exercised in the improvement of thoroughly good English materials. Nor does the cellar, either as regards qualities or prices, make one regret the attractiveness of the comestibles. Light and cheap wines, but good of their class, find their place along with more expensive and distinguished vintages. If any of our readers, fresh from the domestic board, are in search of a *locale* where they may take their sisters, cousins, or others nearer and dearer, to dine, and praise as ladies only can, let them visit the Maison Dorée, and we venture to say that they will have a pleasant reminiscence stored up, and, we hope, a *soupçon* of gratitude to their pioneer. To deserve success is the evident rule of the proprietor. We trust he may obtain his deserts; and that is in his case, though not always, a benevolent wish. We only hope that, if successful, he will not relax his scrupulous attention to the needs of that sorely tried, if sometimes captious class, the errant diners of London. The supper department does not come within our province; but, as "a wrinkle," we cannot help saying, try it.

What Simpson's is to the Strand, Blanchard's in Beak Street is to Regent Street, though the tariff is slightly cheaper than at the former place. Soup or fish, joint, vegetables, and cheese, are offered at 2*s.* 6*d.* instead of 2*s.* 9*d.*, while a more varied dinner is served for 3*s.* 6*d.*, and an elaborate extended *menu* for 5*s.* The braised beef is a *specialité* of this house, as "saddle o' mutton" makes Simpson renowned. The place is well managed, and we think that the arrangement of the tables, the attendance generally, and the ventilation, above all, are well carried out; but we are obliged to confess that, for unvarying excellence of quality of meat, Simpson's has the preference. We took a friend to dine at Blanchard's one Sunday, and the result was disappointing; for there should be no inequality of meat in so good a house. Well balanced minds, however, will not set one chance defect against many merits, and we honestly believe that the reader will not generally be disappointed, but will be well contented in Beak Street. A good and well served dinner may be followed by a quiet weed and cup of excellent coffee, or a whisky toddy in that most comfortable of smoking rooms; and let not the observant visitor fail to remark the ceiling by Cubitt. It is of wood, pierced in cunning

patterns, at once ornamental and a most effective ventilator, and we wish that Simpson's had the like.

We made a party, obedient to behests laid upon us, to test the more expensive and elaborate cuisine of the Burlington, belonging to the same proprietor. Our readers will understand that we do not consider it as belonging to the *juste milieu* class; and will also bear in mind that we are nothing if not critical, especially over a high-priced dinner, which should be correspondingly good, complete in all points, and well served. All joints are excluded from the carte; the artistes being so thoroughly French, as to repudiate the possibility of adding even a *biftek Anglais*. We chose the 5*s*. dinner. A reversible carte offered on each side a different *menu*, an absurdly awkward arrangement, instead of presenting both at the same glance for comparison and choice. The soup was not first-rate; plaice figured as flounders—and we could not be blind to the fact that "portions" for three looked much more like portions for two. The wine was exceptionally dear, and decidedly disappointing,—in fact, we thought it bad.

It may be that dining *à la carte* might be more successful,—but it would certainly cost more. The paucity of guests seemed to indicate that neither *à prix fixe* nor *à la carte* does a Burlington dinner form an attraction; besides, we think that a *menu* which absolutely omits a *rôti* is incomplete.

We leave uncriticised the Pall Mall and St. James's Restaurants, and intrude not into the coffee-room of the Tavistock and Albion, etc. They are beside our present object, and we conclude our studies in western dining-rooms with visits to three in the parallel of Oxford Street, beginning at the Scotch Stores, 122, Oxford Street. An advertisement in the *Queen* assures ladies that they can here dine or lunch comfortably and privately. Their dining-room is, doubtless, lighter and airier than the one we were in, which was like the hall of a very small peel house, say the Tower of Glendearg. We hope, too, that their dinner is not overlooked by such grim and brawny warriors in tartan, as make one uncomfortable in the dining-room of the sterner sex. Macgregor holds his dirk to his throat as if he were an impersonation of the Solomonic proverb, and suggests nightmare of the most uncomfortable description. Scotland, at all events in Glasgow, challenges comparison with London in its "restauration," and the Scotch Stores certainly furnish good meats and drinks; but, whether the natural desire to get the most out of the Saxon—which came in with gentle King Jamie, and is, they say, ineradicable ever since—prevails or no, we cannot say much for the liberality of the quantity supplied. It is

better than the Albany, and inferior to Bibra's. Service and attendance are good, the latter especially so, and Sabbatical inhospitality does not prevail. The prices per dish are moderate, and, on the whole, the Scotch Stores are a fair specimen of the London dining-room.

Observant readers, who walk about with their eyes open, have seen the advertisement of the Oxford Music Hall, asking, why do people go there; because they can't resist "Temptation." We heard of a *table d'hôte* at the Oxford; and, following a friend's advice, at 6-30 we presented ourselves in a comfortable, well-appointed dining-room. About thirty or thirty-five sat down to dinner. Two kinds of soup, a duplicate choice of fish, followed by joints, fowls, curry, iced pudding, and cheese, were all duly served to us; and all, as far as our capacity enabled us to judge, were good, and the charge was 2*s*.!! There was an abundant supply, and the service was in all respects satisfactory. Of course a *table d'hôte* has the disadvantage of a fixed hour; some, too, will reflect on the possibilities of company, for our insular mind often applies to dinner the sadness of our pleasure, which dear old Froissart communicates. Outside the family dinner, we like isolation in our feeding, as though *je dinerai seul*, was the rule of life as *je mourrai seul* is the end of it. We thought that an extravagant wine carte might perhaps be looked for; but were pleasantly disappointed, and we only wondered that the dining-room, which would accommodate nearly fifty, was not completely filled. We ought to mention that finger glasses for comfort, and rosewater for a small luxury, were added; and, though an extra, a capital cup of coffee was served to the wise appreciator of that crowning comfort.

Now, we think this the most noteworthy experience in our chequered career of dining. The personal supervision of the proprietor is given, and we must record *ex animo* the desire evinced that all the guests should be duly attended to.

We think that the temptation of the Oxford is the Oxford dinner. The guests thereat are *ipso facto* on the free list, and walk, if so minded, from the dining-room into the hall. Can any one of the readers of the "Food Journal" say where they can obtain so much for a florin? As a London dinner, we are bound to say that the Oxford *table d'hôte* stands alone. It is a week-day advantage only. On Sundays the "prêche," as the Huguenots would call it, occupies the ground. We mention this simply to prevent disappointment. We only add, what a meditation of possibilities this cheap, well-arranged dinner suggests, contrasted with the supplies and demands of the numerous dining-rooms! W.

[TO BE CONTINUED.]

ON STIMULANTS.

No. 1.—COCA.

ONE of the most remarkable phenomena which claim the attention of the physiologist, is the action of stimulants on the human organism. It is a well-ascertained fact that they are capable of supporting the organism in the absence of food; and, whatever the inclinations of individuals may have been, or still are, with regard to their use, it is certain that nations of the past and present cannot, or, at any rate, do not exist without them. Von Bibra, in his preface to "Die Narkotischen Genuss-Mittel und der Mensch," assumes the following:—"Coffee-leaves, in the form of infusions, are taken by 2,000,000 of human beings; Paraguay tea is consumed by 10,000,000; coca by as many; betel is chewed by 100,000,000; chicory, either pure or mixed with coffee, by 40,000,000; cacao, either as chocolate, or in some other form, by 50,000,000; 300,000,000 eat or smoke haschish; 400,000,000 use opium; Chinese tea is drunk by 500,000,000; coffee by 100,000,000. All known peoples of the earth are addicted to the use of tobacco, chiefly in the form of smoking; otherwise by snuffing or chewing." He adds that, with the exception of cacao, perhaps none of these substances has any direct nutritive power. In corroboration of the above figures stand the reports concerning production, consumption, and taxation of these articles, from which a fair inference can be easily drawn by anybody doubting Bibra's accuracy.

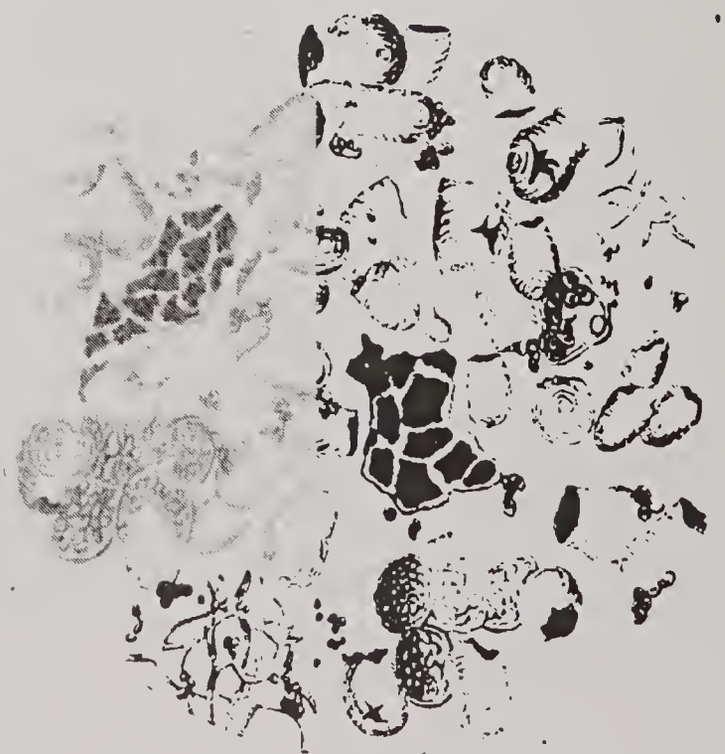
In the present article the action of coca will be considered, as described by various travellers in South America. The substance itself is little known in Europe, but it has received considerable attention lately, and a proposal has been made, or at least hinted at, by Dr. Abl, of Zara, to introduce it here. He says: "Coca, in the hands of cautious captains, will very probably put a stop to the much more disgusting habit of chewing tobacco, and would certainly diminish the number of those who, after shipwreck, perish from want of food." The descriptions given by Pöppig and Weddell * are not likely to stimulate the desire for the importation of the Peruvian herb. They describe the *coquero* as a sickly, tottering being, with hollow eyes, pale lips and gums, black marks at the corners of the mouth, and greenish and stumpy teeth,—a

* "Voyage dans le Nord de la Boline."

FIGURE 5.

Cocoa adulterated with common Arrowroot, containing Potato Starch, as seen by ⅛ inch power, and A eye-piece.

FIGURE 6.

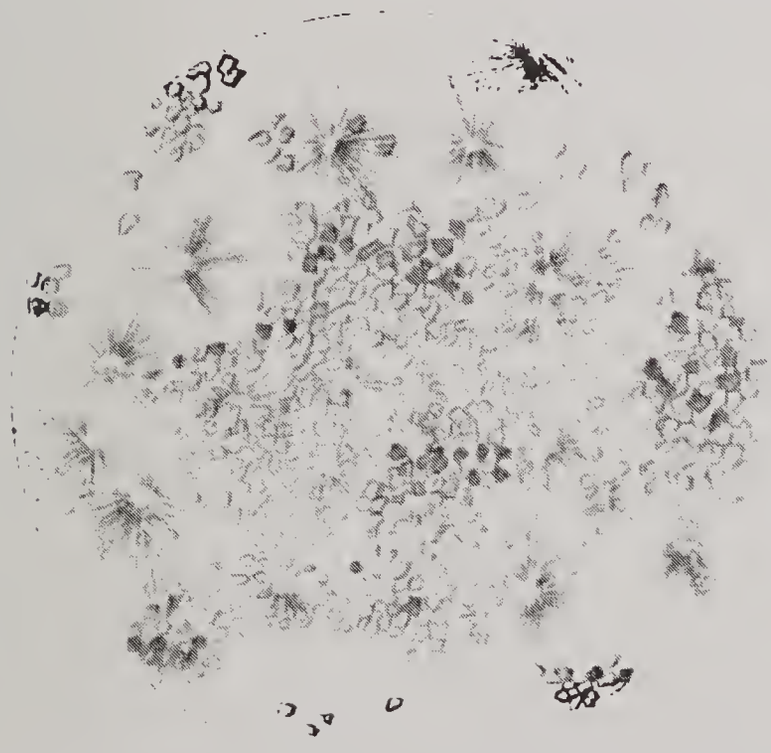


Cocoa adulterated with Sago Starch, as seen by ⅛ inch power, and A eye-piece.

FIGURE 7.

Pure decorticated Cocoa, with ⅛ inch power, and A eye-piece.
a, starch cells. b, inner membrane. c, portions of embryo.

FIGURE 8.



Lard adulterated with Rice Starch, the granules of which have been coloured with Tincture of Iodine.

J.M.J.O.

somewhat hideous counterpart to the inveterate drunkard of our own regions. Von Tschudi* mentions a case of a somewhat different character. He says: "A cholo of Huari, named Hatun Huamang, was employed by me in very laborious digging. During the whole time he was in my service, viz., five days and nights, he never tasted any food, and took only two hour's sleep nightly; but, at intervals of two and a half or three hours, he regularly masticated about half an ounce of coca leaves, and he kept an acullico continually in his mouth. I was constantly beside him, and, therefore, had the opportunity of closely observing him. The work for which I engaged him being finished, heaccompanied me on a twelve days' journey of twenty-three leagues across the level heights. Though on foot, he kept up with the pace of my mule, and halted only for the chacchar. On leaving me, he declared that he would willingly engage himself again for the same amount of work, and that he would go through it without food, if I would but allow him a sufficient supply of coca. The village priest assured me that this man was 62 years of age, and that he had never known him to be ill in all his life."

The *Erythroxylon coca* is a shrub about six feet high, with bright green leaves and white blossoms. The latter are succeeded by small scarlet berries; the former are described as shaped similarly to the leaf of the cherry tree. In the tables accompanying Von Bibra's work, some specimens are shown in nature print *(Naturselbst-druck)*. They appear to be considerably smaller than cherry leaves, although in shape not unlike them. The coca is raised for the seed, in garden beds, called almazigas. It requires humidity; therefore maize is sown between the *matas*, or young shoots, to screen them from the too great influence of the sun. When the leaves are ripe, that is to say, when on being bent they crack or break off, the gathering commences, and they are stripped from the branches, a task usually performed by women. The plant thus rendered leafless is soon again overgrown with verdant foliage. The colour of the leaves when dried is a pale green. The drying demands great care and attention, for if they imbibe damp they become dark, and then a lower price is obtained than when they are green. Coca is not believed to improve by keeping; the inhabitants find it unpalatable at a year old. Von Bibra estimates the yield of one acre (German) at 800 lbs. of dried leaves; and he calculates that 30,000,000 lbs. are annually produced.

The Indians masticate the coca generally in combination with

* "Peru." Reiseskizzen. Translated by Ross.

a feverish condition was produced, with increased heat of the skin, palpitation of the heart, flashes, headache, and vertigo, while the pulse rose from 70 to 134. A peculiar, roaring noise in the ear, a desire to run about, and an apparent enlargement of the intellectual horizon, indicated that the specific influence upon the brain had commenced. A peculiar, hardly describable feeling of increased strength, agility, and impulse to exertion follows; it is the first symptom of the intoxication, which is, however, quite different from the exaltation produced by alcoholics. While the latter manifests itself by increased but irregular action on the muscles, the individual intoxicated by coca feels but a gradually augmented vigour, and a desire to spend his newly-acquired strength in active labour. After some time the intellectual sphere participates in this general exaltation, while the sensibility seems to be hardly influenced; the effect is thus quite different from that produced by coffee, and resembles in some degree that of opium. Dr. Mantegazza could, in this excited condition, write with ease and regularity. After he had taken 4 dr., he was seized with the peculiar feeling of being isolated from the external world; and, with an irresistible inclination to gymnastic exercise, he jumped upon the writing table, moving about with ease, without breaking the lamp or other objects upon it. In his normal condition, the learned doctor is by no means given to gymnastic exercise. After this, a state of torpidity came on, accompanied by a feeling of intense comfort—consciousness being all the time perfectly clear—and by an instinctive wish not to move a limb during the whole day, not even a finger. During this sensation, sleep sets in, attended by odd and rapidly changing dreams; it may last a whole day without leaving a debility or indisposition of any kind. Dr. Mantegazza increased the dose to 18 dr. in one day; his pulse rose in consequence of it to 134. Three hours of sleep sufficed to set him right again, so that he was able to follow his daily occupation without the least indisposition; on the contrary, even with unusual facility. He had abstained for forty hours from food of any kind, and the meals then taken were very well digested. During the last stage of intoxication, and in the moment when the delirium was most intense, he described his feelings to several of his colleagues, who were watching him, as being most exquisite, ten years with coca being preferable to a million of centuries without. The description was given in writing by Dr. Mantegazza, thus:—"*Io preferiscata una vita di* 10 *anni con coca che un di* 1,000,000 *secoli senza coca.*"

E. H. Fournier.

COVENT GARDEN MARKET.

Covent Garden, formerly the Convent Garden, derives its name from having been a garden attached to the convent of the Abbots of Westminster. At the dissolution of the monasteries and religious houses, the Convent garden and its appurtenances were given to Edward, Duke of Somerset, the Protector, but on his attainder it reverted to the Crown, and in 1552, Edward VI. granted it to John, Earl of Bedford. The names of several streets in the neighbourhood,—such as Russell Street, Bedford Street, and Bedfordbury,—reminding one of the same names employed in connection with fine streets and squares not far distant, suggest the possession of most valuable property in the hands of the Bedford family, and that the suggestion is correct need not be insisted on. For more than three centuries the Bedford family has owned a large portion of the ground in what, in these matter of fact days, we call the W.C. district; and no one can ramble in the neighbourhood of Covent Garden Market, without every now and then being reminded of the territorial rights of the ducal house of Bedford. Francis, the fourth Earl, determined on inclosing part of the Convent garden, and in 1634 engaged the renowned Inigo Jones to superintend the alterations. The celebrated architect built the handsome piazzas on the north and east sides, and these piazzas were originally continued along the south-eastern side, where the Hummums Hotel now stands; but this portion of the structure, a few years after its erection, was so injured by fire in adjoining houses, that it was pulled down and not rebuilt. The Italian *piazza*, the reader will remember, corresponds to the French *place* or the English *square*, but the Italian idea always includes a covered way or colonnade. Everybody now regrets that Sir Christopher Wren was not allowed to carry out his designs in relation to St. Paul's, and in like manner it may be regretted that the plans of Inigo Jones in regard to Covent Garden were not adopted. Had this been done it would have become one of the finest *places* or squares in London, instead of being, as now, an eyesore and a failure, continually suggesting a painful contrast between what the place might have been, and is; and a still greater contrast between what it is, and what it ought to be. But the fame of Inigo Jones yet clings to the locality, and

is connected especially with St. Paul's church, in reference to the erection of which a characteristic anecdote is related. In 1640 the Earl of Bedford sent for Inigo Jones, to build a chapel for the tenants living on the estate. "I wish," said the Earl, "that the edifice be as plain, as convenient, and as little expensive as possible; in fact, I would not have it much better than a barn." "Then, my lord," said the architect, "you shall have the handsomest barn in England." The dealers in the present day would often be grateful for even the shelter of a barn for themselves and their goods. When St. Paul's was built, the great square of Covent Garden was thus formed: the wall of the garden of Bedford House stood on the south; on the north and east sides were the piazzas; and on the west this church. About 1656, a few temporary sheds and stalls at the back of the garden wall sprang up, and this was the origin of the market, which was legally established by Royal Letters Patent, granted by Charles the Second, in 1682, "that the said William, Earl of Bedford, his heirs and assigns, should and might from thenceforth for ever have, hold, and keep a market," etc. Bedford House was pulled down in 1704, and a line of street arose in its place. During these alterations the stall and shed keepers huddled together in a pell-mell sort of way (Covent Garden seems always to have been afflicted with makeshift and hap-hazard) in the centre of the square; and here fruits, vegetables, herbs, etc.,—the etc. being very comprehensive—were sold.

Many who still have business relations with the market remember vividly what it was about the year 1825. It was then simply an irregular collection of sheds, or huts, or stalls,—shops would be too fine a word,—in which were sold all sorts of articles; china and crockery, old iron and knicknackery, live poultry and birds, eggs and butter, fruit, flowers, and vegetables—all in a chaotic display as befitted the place, which was badly paved and badly managed in every way. The immediate neighbourhood, too, was frequently the scene of midnight and early morning brawls and riot. There stood at the east end a low building called Carpenter's Coffee-house; it was a notorious house, with a pet appellation familiar to the readers of the chronicles of the time when George the Fourth was King, under the name of "The Finish;" and here the Tom and Jerry of the period could obtain refreshments of a different kind from those in which they had previously too much indulged. There were then no regular constables, and legal authority was represented by the persons of an old beadle and an older watchman, both worn-out, and capable of doing little more than calling out the hours. The late Duke of Bedford let this market—to apply to the place a

too flattering term—on lease to Messrs. Prince and Lowden, whose chief aim seems to have been to levy high tolls, which suited the lessees very well, but which was grossly unfair both to the selling and buying patrons of the market, whose interests were not in the least studied. The natural result was, that the lessees and the market gardeners were continually in litigation, and the latter, acting on the motto that union is strength, raised money among themselves to defend their rights. In 1828 this co-operation developed into the formation of the Market Gardeners', Nurserymen's and Farmers' Association, an association which has been more or less in antagonism with the owner and managers of Covent Garden market ever since, showing there is wrong somewhere. Where that wrong exists, will presently be seen.

At the expiration of the lease in 1828, the Duke determined to erect a market, for it can scarcely be said that a building for the purpose existed before. In that year a private Act of Parliament was obtained. The plans of Mr. Fowler were approved and carried out, at a cost of about 43,000*l.* A façade was added on the north and west in something like harmony with Inigo Jones's piazzas. The centre is formed by an arch on the entablature of two Tuscan columns, with a single-faced archivolt supported by two piers, which sustain an elevated triangular pediment. The tympanum of this is adorned by the armorial bearings and motto of the Bedford family, *che sara sara* (what will be will be)—a motto well illustrated by the extraordinary apathy which has allowed things to take their own course at Covent Garden market, as though the doctrine of fatalism had crushed out the spirit of energy. On each side of this centre is a colonnade of the Tuscan order, projecting in front of the slopes. The columns on the north, south, and east are of granite, in the Palladian-Tuscan style, and, with the ornamental balustrade, have a fine effect. Over the centre of the building are the Bedford conservatories. The appellation suggests something very different from what this part of the market is; it is simply dreary, desolate and dull, and throughout conveys the idea of deadened enterprise. The central arcade, or grand avenue running east and west, consists of a number of poorly built shops; but the character of the structures is not noticed by one in a thousand, consequent on the splendid display of fruits, flowers, and vegetables in the windows. This arcade is a favourite lounge, and in fine weather, when flowers abound and plants are in luxurious profusion, a saunter about Covent Garden Market is a pleasant way of spending an hour or so. But it is impossible for the thoughtful saunterer to avoid the conviction, which is forced upon him at

every turn, that the market is far from what it ought to be. Mr. Fowler's plans appear to have ignored its purposes, and certainly its probable development. At first, the "shops" were mere sheds, utterly unfitted for the trade that might reasonably have been expected, and it was found necessary to throw two into one; and then the granite pillars, handsome though they be, occupy too much out of an inadequate space, and cause convenience and comfort to be sacrificed to show.

The two great defects of Covent Garden Market are apparent to the most casual observer, but they are seriously felt by the growers, salesmen, and purchasers; and the only marvel is that they have existed so long. These defects are insufficient space and want of shelter. For more than twenty years, the Market Gardeners' Association has been endeavouring to obtain a reform in both these respects, but in vain. This society consists of food producers, to whom the metropolis is to a great extent indebted for its supply of vegetables and fruit, and therefore their representations on a subject with which they are practically acquainted, and involving great hardships to themselves, have deserved more consideration than they have met with. The association has advocated the extension of the market as far east as Bow Street. This would give plenty of room to carry on the business, and would be a great boon, not only to the growers, who now justly complain that they are not studied, but to the public. Nor would this additional space be more than is wanted. The present market is notoriously too small for the quantity of goods forwarded, besides which, a great deal more would be sent, were there fair facilities for its reception. Immense quantities of vegetables and fruit are *not* sent to London for no other reason, than that there is not adequate market accommodation. The supply which the metropolis could command, did it possess, as it ought to have, a fine large commodious market, is practically limitless. In the immediate suburbs, in Essex, Middlesex, Kent, and Surrey, a very large proportion of the land is devoted to the production of vegetable food for that omnivorous monster, London; and food supplies, in these railway days, come from all parts of the country and from abroad,—for example, early cabbages and broccoli from Cornwall; peas, grapes and vegetables from the Channel Islands; lettuce, peas, etc., from France; potatoes from Belgium, Holland, and the Scilly Islands; walnuts and cherries from Belgium; and especially large supplies of fruit from the sunny orchards and vineyards of *la belle* France. It need scarcely be pointed out that, if it were not for the foreign supply, London would in some seasons have very little fruit, so much are we, in this variable climate

of ours, at the mercy of frosts and blights. It is true that the foreign growers who send in these supplies can generally reckon on shelter for their goods, an unfair advantage which they have over the English growers; but they cannot always depend on this, for the supply may be exceptionally large, and they can never ensure sufficient accommodation in unloading and delivery. Inadequate space is indeed an undeniable fact, of which any one will be convinced who visits the market—and it is one of the sights of London—early in the morning. He will find the streets all round blocked up with railway vans, market carts, and heavily-laden waggons, and the whole neighbourhood a scene of confusion which ought not to be necessary. Intimately connected with this defect is the want of shelter; for producers and products are left exposed to all kinds of weather, to the injury of both; and both are treated with about as much consideration. The Association to which allusion has been made has had many meetings on the subject, and has memorialised the Duke of Bedford to cover in the market, offering to pay an increased rent for the accommodation. But the reform has never come, and does not seem likely to come. The consequences are, that the health of that large proportion of the salesmen for whom no shelter is provided is injured by standing in rain and wind for hours; that they frequently cannot expose their fruit for sale, and trade is thus deadened; and that when soft fruit is exposed it is frequently spoilt, fermentation sets in, and the poorer class, who become the purchasers, suffer from illness. It is really marvellous that the great metropolitan market should possess far less accommodation than the markets of many a provincial town in our own or foreign countries; not to make odious comparison with splendid markets such as those, for example, of Paris. London notoriously requires more commodious markets than it possesses, and nowhere is this great want so keenly felt by all concerned as in Bedford-land.

J. M. Philp.

A new phase is coming over the wine trade in London, as it affects the consumer. A large establishment has been opened in Glasshouse Street, termed "Bodega" Spanish Wine Cellars—at which the wine drinker can buy in bulk, or take his sherry (or whatever else his "vanity" may be), not only direct from the wood, but in dock glasses. The promoters of this establishment gained considerable reputation last year at the Manchester Agricultural Show, by bringing their wines into the showyard in exceedingly good condition; and we heartily welcome the appearance of this undertaking at the West End.

LESSONS FROM CHINA.

Of all the people under the sun, with the exception of our brethren of the Emerald Isle, the English are certainly the most improvident. Perhaps this is a natural effect of self-reliance, strong constitutions, and success. Those who have plenty of cheese are not over particular about the thickness of the parings, and will not condescend to scrape the rind; and Cobbett used to say that Ireland was utterly ruined by "that accursed root—the potato."

But England is as remarkable for her poverty as for her wealth, and the two do not always live in the best possible harmony; any economist speaking of the distribution of wealth will invariably quote England as affording the most remarkable instance of destitution by the side of abundance. We may account for much, by quoting the effects of lavish luxury, and intemperance resulting partly from climate; we may attribute a good deal of the squalid appearance of the lowest classes in our towns to the smoke-laden atmosphere; but, after making all the allowances and all the deductions possible, there remain the simple facts—that we have a vast deal of poverty amongst us—and that we are not a provident people as regards the necessaries of life. We waste our manure, we waste our fuel, and we waste our food, to a lamentable extent. At the present moment these assertions run little risk of contradiction. Twenty years ago they would have been laughed at, and passed over with contempt. We admit now that food is dearer than it should be; and, as we are trying to supply the deficiencies by all manner of expedients, the efforts in this direction cannot fail to produce good results in the end.

But our resources are far, very far from being cultivated to the utmost. Hear what an intelligent man, a native of one of the most careful nations on earth in material matters, says of the Chinese, that agglomeration of 500 millions, which we, in our Western pride, regard as half civilized. M. Simon, consul of France in China, gave the Acclimatisation Society of Paris a sketch of his observations and experiences in the latter country, and recounted some traits of character of much interest, but these are beyond our scope, as we have only to deal with the question of supplies. China possesses no meadow land except in the extreme north, and Mongolia

abounds in cattle, but it is not easy to bring them eight or nine hundred leagues to feed the south; so that the Chinese have to look elsewhere for their supplies. Fresh water fish, of which, in spite of Mr. Frank Buckland's teaching and energetic endeavours, we take so little account, forms one great element of food; the Chinese have for centuries made the breeding and preservation of fish an occupation of the highest importance; the rivers, rivulets, lakes and canals, which abound in two-thirds of the country, swarm with fish, and it is almost impossible to form a notion of the fecundity which ages of care have brought about; fishing is going on everywhere, not only in streams, lakes, and canals of all dimensions, but in the ditches of the rice fields, and even in pools of rain water; indeed, there are some kinds of fish that multiply so rapidly that they spawn twice a month. The Chinese use nets of all kinds, and ground lines, and also employ the cormorant to aid in the taking of fish; it forms the everyday food of at least 350 millions of the inhabitants, and the supply never fails; a self-evident fact, when we know that ordinary fish costs only about 1*d.* per lb. in China, and that the most delicate kind is only worth from 5*d.* to 6*d.* But if fish is the common, it is not the only animal food of this people; for the pig, the duck, and the fowl are also grand resources. Pork has become such an important article of food, that it is dearer than beef, although the latter is scarcer; as to ducks, they may be seen by flocks of many thousands on the waters, where they are preserved with much care. Children seated in little canoes guard them, but the drakes lead them to and from the water, watch them from the shore and recall them with a peculiar cry which the young ducklings seem perfectly to understand. Ducks form an important article of trade, and when dried and pressed between two boards like plants in an herbarium, they are sent all over the empire. Dogs of a peculiar breed, and even rats, are prepared in the same way for the poorer classes. Sheep and goats come next to the pig, duck, and fowl in importance; as to game, it is so plentiful, by preservation no doubt, that a small cart load is not worth more than about 5*s.* in the capital.

The basis of Chinese food, is, however, vegetable; and when we remember that from 400 to 500 millions of Chinese live in a country not more than four or five times larger than France, which has not a tenth part of the population, it is easy to form an idea of the pitch to which cultivation has been carried. There are from seventy to eighty kinds of vegetable substances grown in China, twenty-five of which at least are produced as food. Rice is the most important of all, and the pains that are taken in its cultivation are extraordinary;

in order to supply the rice grounds with water, enormous mountains have been pierced, immense lakes excavated, the waters of rivers and small streams are carefully retained, and turned into small canals and ditches, which surround and intersect the fields in every direction. M. Simon says, that he believes the world never saw a greater or more admirable work than that vast system of irrigation which, from the West of China to the sea, places all the water under the hands of the farmer and gardener. Not only rice, but every kind of crop is cultivated with the utmost pains. The result is magnificent; the yield of rice is nearly five tons per acre, and that of other crops in proportion. Labour alone, even with the most complete irrigation, would not yield such a result; the secret is in the application of manure; every atom of refuse is returned to the land in China, and where the supply is small, it is made up from the sea; without any great science, the Chinese have established a complete system of manuring in which nothing is lost, and fœcal matter of all kinds, decayed vegetables, bones, lime, oyster shells, fish and sea weed, are used up. They have a dozen recognised methods of preparing manure according to the soil, the crop, and other circumstances; they are not very fastidious, and the smells in the villages and towns are not agreeable; but the grand problem is solved, of employing the entire refuse of hundreds of millions of people—with immense labour it is true, but with great profit also—in the production of food. So complete is the system, that the manure is carried in barges and in pails slung on bamboos wherever it is wanted, often to great distances.

In the use of fuel the Chinese show the same economy; with a few pounds of dried vegetable matter, which does not cost a farthing per pound, they will cook a meal for a whole family.

We boast of our science, our industry, our wealth; but how long will it take us to arrive at a state of economy which has existed throughout the Chinese empire during so many centuries?

G. W. Yapp.

The cheese factory system of America, of which we hope soon to give an account, seems to have taken fair root in Cheshire and Derbyshire. It is now proposed to extend the same advantages to butter, which, we think, might be made an exceedingly profitable branch of trade, if carried on within easy distance of our large cities. Not only would dairymen and cowkeepers benefit, but the purchasers also would secure a much more uniform and better kind of butter, while farmers generally would have a wholesome supervision exercised over them as to the class of cows, their feeding, their pasturage, and other points, on which at present a great deal of carelessness exists.

THE MINERAL CONSTITUENTS OF VEGETABLES.

The old opinion, that the mineral constituents of plants and animals owe their occurrence in the various organs and tissues to accidental circumstances, and that their presence is in no way necessary or essential to the life of the animal or plant, has ceased to be entertained; and it is now universally admitted that the mineral constituents, though existing only in minute quantity, are as essential as the organic elements which enter into the composition of the heat-producing and flesh-forming food. But, though the researches of modern chemists and physiologists have clearly demonstrated the necessity for these substances, yet their importance, and the necessity (increased by the small proportion in which they occur) of adopting such methods of cooking our food as may, to the greatest possible extent, preserve its mineral ingredients, is constantly overlooked. Though the quantity of mineral matter found in the vegetable kingdom is small—often less than 1 per cent. of the fresh vegetable—yet it is so essential, that its total withdrawal from our diet would be followed by consequences fatal to health, and even to life itself. I have recently made analyses of potatoes, turnips, and carrots, in their raw state and after cooking, in order to ascertain the amount of mineral matter which is extracted by the water used in the process. The results of my analyses are contained in the following tables, which show the amount found in 10,000 parts of each vegetable both before and after cooking, and the absolute and proportional amount extracted by the water used in the cooking process.

Table I.—Showing the Amount of Mineral Matters in Cooked and Uncooked Vegetables.

	Potatoes.		Carrots.		Turnips.	
	Raw.	*Boiled.*	*Raw.*	*Boiled.*	*Raw.*	*Boiled.*
Potash .. .. } Soda .. .. }	54·79	34·94	38·00	26·03	24·66	17·56
			8·17	4·45	8·57	4·91
Lime	3·05	2·17	4·16	3·42	4·12	3·75
Magnesia	2·43	2.00	3.50	2·17	2·70	2·17
Oxide of Iron, Alumina ..	0·45	0·39	0.60	0.62	0·31	0.20
Chlorine	2·17	1·29	trace	trace	3·33	1·94
Sulphuric Acid ..	6·53	4·09	4·17	2·21	8·65	5·07
Phosphoric Acid	12·01	7·02	10·75	6·36	5·86	3·09
Silica	1·91	2·00	1·01	0.90	2·17	2·60
Total	83·34	53·90	70·36	46·16	60·37	41·29

Table II.—Amount of Mineral Matter Extracted by Boiling from 10,000 *parts of*

	Potatoes.		Carrots.		Turnips.
Potash	19·85	....	11·97	....	7·10
Soda		....	3·72	....	3·66
Lime	0·88	....	0·74	....	0·37
Magnesia	0·43	....	1·33	....	0·53
Oxide of Iron, Alumina ..	0·06	....	—	....	0·09
Chlorine	0·88	....	—	....	1·39
Sulphuric Acid	2·44	....	1·96	....	3·58
Phosphoric Acid..	4·99	....	4·39	....	2·77
Silica	—	....	0·11	....	—
Total..	29·53	....	24·22	....	19·49

Table III.—Percentage of Mineral Matter Extracted by Boiling from

	Potatoes.		Carrots.		Turnips.
Potash	36·22	....	31·50	....	28·79
Soda		....	45·53	....	42·70
Lime	28·85	....	17·78	....	8·98
Magnesia	17·69	....	38·28	....	19·63
Oxide of Iron, Alumina ..	13·33	....	—	....	29·03
Chlorine	37·32	....	—	....	41·44
Sulphuric Acid	37·36	....	47·00	....	41·38
Phosphoric Acid..	41·63	....	40·83	....	47·26
Silica	—	....	10·89	....	—
Total loss per cent. of Mineral Matter ..	35·47	....	34·41	....	32·28

In looking at the above tables, it must be remembered that, within certain limits, the quantity and composition of plant ashes vary according to the soil upon which the plants have been grown, and that the amount of matter extracted from vegetables by boiling must also vary greatly with circumstances.

The figures in Table I., representing the composition of the cooked and uncooked vegetables, are each the mean of three analyses. For the analyses of the raw substance, 1,000 grammes were dried at 120° c. (248° Fah.), the dry residue incinerated in a platinum dish, at the lowest possible temperature, and the ash thus obtained analysed in the usual way. Another portion of 1,000 grammes was boiled, and, after boiling, the liquid was carefully filtered, and the boiled vegetable dried, incinerated, and the ash analysed in exactly the same way as the uncooked sample.

Table I. shows the results of these analyses; in these the carbonic acid of the ash has been omitted, as it is not a constituent of the plant, but a product of the combustion of its organic part. Table II. shows the absolute amount of mineral matter lost by 10,000 parts of the vegetable during boiling, whilst Table III. shows the percentage loss of each salt.

These tables prove to us that there is a great loss of mineral matter during the boiling of our vegetables; take, for instance, potatoes. Before cooking, 10,000 parts of this vegetable contain 83½ of

mineral matter; after cooking, the same quantity contains not quite 54 parts, which represents a loss of about 35½ per cent. of the mineral matter originally present. In the carrot the loss amounts to 34½ per cent., whilst in the turnip it is 32¼ per cent.; so we may conclude that, by cooking such vegetables as these in the ordinary manner, about one-third of their mineral matter is extracted and lost. Looking at Table II., we find that this loss is chiefly in potash, and phosphoric and sulphuric acids. Of these three substances, potash and phosphoric acid are just the most valuable mineral constituents of our food. The loss of soda, of chlorine, lime and magnesia, is not of much consequence, even though it were much greater than it appears to be; but the loss of potash and phosphoric acid is of much more importance, for we depend entirely upon our vegetable food for a sufficient supply of these two substances. It is quite true that phosphoric acid occurs in other articles of food, such as wheaten flour, and consequently in bread; still, the supply is not so great that we can afford to waste from 40 to 50 per cent. of that which exists in our potatoes and other vegetables. Potash is even of more importance than phosphoric acid, and if we exclude it from our diet, our health would quickly fail. It is in consequence of eating salted provisions, in which the potash is to a great extent replaced by soda, and being deprived of sufficient vegetable food to supply this substance, that sailors become liable to scurvy; and, as a preventive for this disease, ships are supplied with lime-juice, a liquid which contains a large quantity of potash combined with certain organic acids. If used regularly, lime-juice will prevent scurvy, and it does so, on account of the salts of potash it contains. Now, what the lime-juice is to sailors, so are the potash plants, such as potatoes, turnips, carrots, asparagus, cabbage, etc., to us on land. Without these potash plants, we should be liable to scurvy or similar diseases. Potatoes do not contain so much nutriment, nor so much starch, as wheat flour or many other substances, but they contain this potash. If we were to discard potatoes and similar plants, and eat nothing but bread, we should, undoubtedly, suffer in our health, because, though bread contains a large quantity of nitrogenous matter, of starch, and of phosphates, yet it is deficient in potash. If then these mineral matters are of such vital importance, and occur as they do, only in very small quantity, we ought certainly to take some means to prevent their waste; either we should employ the water in which our vegetables are boiled for making soups, or else adopt a mode of cooking which would not necessitate the loss of so much valuable material.

ARTHUR E. DAVIES, Ph.D.

DOMESTIC RECIPES.

The Editor desires to appeal to his readers, and especially to the ladies, for contributions of recipes for cheap, tasty, and serviceable dishes, both for poor households and those of the higher classes.

SCOTCH WOODCOCK.—AN EXCELLENT BREAKFAST DISH.

Take a wine glass full of cream, a piece of butter of the size of a walnut, a table-spoonful of anchovy paste, the yolks of three eggs with the whites of two, and red and black pepper *à discrétion;* mix them well together, taking care that the paste is dissolved; place the saucepan on a bright fire, and stir it *always the same way.* When it is cooked it will become thick. Serve on hot buttered toast, as quickly as possible.

FRENCH PANCAKES.

Take two eggs, 2 ozs. of butter, 2 ozs. of sifted sugar, 2 ozs. of flour, and half a pint of milk; beat the eggs thoroughly, and put them into a basin with the butter, which should be beaten to a cream; stir in the sugar and flour, and when these ingredients are well mixed, add the milk; keep stirring and beating the whole for a few minutes, put it on well-buttered plates, and bake in a quick oven for twenty minutes. Serve with a layer of jam between each.

MRS. MUSTOE'S CURRY.

Take a rabbit, cut off all the meat in small pieces, and fry them lightly in a fryingpan, without any fat; mix two table-spoonfuls of curry powder, with a tea-cupful of vinegar, two teaspoonfuls of chutney, and the same quantity of flour; cut some onions in slices, fry them brown in butter, mix with the preceding ingredients, and stew very slowly for half an hour.

OATMEAL PUDDING.

Put into one quart of milk, just warm, one pint of whole oatmeal, carefully picked, and let it soak for two hours at least. Add ½ lb. of stoned raisins, ½ lb. of currants, a little salt, 4 oz. of sugar, and full ½ lb. of butter. It is a capital pudding, whether baked or boiled.—*From an old MS.*

GOOSEBERRY FOOL.

Boil one quart of gooseberries in a skillet, closely covered, in as much water as will cover them, until they are boiled to pieces. Then put them in a pewter dish. Let them boil for about eight minutes, and stir them altogether, adding ½ lb. of sugar and ½ lb. of butter. Then add the yolks of 10 eggs, with the whites of three, and stir them together. It must not boil after the butter is in.—*From an old MS.*

NOTES OF THE MONTH.

THE TRADE in the lowest class of adulterated tea still continues, and this month Dr. Muter reports that there have been no less than 80 chests exposed for sale, of which he procured samples. This so-called tea consisted of a variety of rubbish, and is being sold for 2½*d.* per lb. It yielded an ash amounting to 22·86 per cent., consisting chiefly of iron filings, and under the microscope presented the structures of many foreign vegetable matters. But the worst sample which came under his notice, was a green tea from India, highly faced, and yielding an ash containing a quantity of copper. This is really a sad thing, because it has previously been a noteworthy fact, that our Indian planters refrained from such practices, and that tea from our own possessions could be depended on. We trust, however, that this prompt discovery and exposure, of what we think is the first case, may discourage the unprincipled persons who are thus disgracing the commercial honour of our Indian planters. The colour seemed to have been produced by roasting in contact with copper, probably in copper pans.

WHITEHAVEN is in a terrible state from fever and general neglect. Out of a population of 19,000 there have lately been 370 cases of typhus, from which one in every six has died. It appears that out of 4,538 inhabited houses, 2,500 have no drainage, except on the surface. The Local Board, as is too often the case, has acquiesced in this wretched state of things until, fortunately for the remaining inhabitants, the Privy Council, through their representative, Dr. Buchanan, is compelling action.

POTATO REFORM.—In a little tract called "Potato Culture," Mr. F. W. Wilkins points out to us a method of generally increasing our potato yield, which is worthy of the most careful trial; for, if his experiments are correct, he has put us in the way of quadrupling the crop of this most useful vegetable. At present, potatoes are planted in rows, about 2 ft. apart, and 10 or 12 in. from each other, the average produce being 240 bushels to the acre, or 6 tons, worth (say, at 3*s.* per bushel) about £36 per acre. By the new method, large whole potatoes are selected, and the eyes, all but one or two, scooped out. They are then planted 4 in. deep, in rows 4 ft., or, if very large, 5 ft. apart. The result is, that each plant produces from half a bushel to one bushel, the potatoes themselves weighing 2 lbs., 3 lbs., 4 lbs., or even 6 lbs. The yield of the acre therefore is 1,360 bushels, instead of 240, and the acre will bring in to the fortunate owner £204 instead of £36. The *rationale* of the proceeding seems to be, that we dwarf and stunt our potatoes by overcrowding, like we do our children in towns, and that the proper mode of treatment is to give to each potato sufficient room to expand, regarding it, in fact, like a young tree. The plants, indeed, grow to such a size that they are obliged to be supported by pea-sticks, to which they must be tied like hops to poles. We most strongly recommend a trial of this new form of potato culture to our gardening readers.

NOT a week passes, but brings before us more and more urgently the necessity for stricter regulations respecting the sale of diseased meat. From Leicester comes the case of a whole family poisoned, and with difficulty recovered, by eating putrid sausages. From Turvey, in Bedfordshire, we have a story of a cow being slaughtered in the last stage of disease, and sent up to the metropolitan market for the benefit of meat-eating Londoners. And we do not hesitate to say that, for every case of the sort of which we hear, there are twenty which do not reach us, but which are overlooked or hushed up. We require a very much more stringent law, to reach every person who dabbles in diseased meat, including the salesman who receives it, the inspector who passes it, the butcher who kills it, and, above all, the owner, for whom imprisonment without a fine would not be at all too severe a punishment.

NOTICES OF BOOKS.

A PAMPHLET has been forwarded to us, entitled, "Public-School Reforms" (Booth, Regent Street), and written by a lady who is well known in the ranks of Sanitarians. For our own parts, so important are the questions involved, and of such interest to the great bulk of English upper or middle class families, that we would willingly see this little *brochure* expand into a more portly volume. Public-school boys are generally the last to take care of themselves; and, although they never go (voluntarily) upon the starving system, they have a habit of dieting themselves in a bold and reckless manner, suggestive of many evils in after life. In fact, as an Eton boy remarked, when spoken to on the subject of food, "fellows didn't care what 'grub' they ate, as long as it was good." In "Public-School Reforms," the "grub" question is discussed, as well as those of bathing, "tubbing," athletics, and others affecting more the moral character of the school and the schoolboy. The point of "fagging" is one on which, as old Rugbæans, we somewhat differ from the writer; but in everything else we entirely agree, and wish that all our abuses were attacked so ably, and yet so judiciously.

We have also received the following books, which we hope to mention more at length in a future number of the Journal. Want of space prevents our giving them now the attention that they deserve :—

"Science for the People." By Thos. Twining, Esq.

"The Wealth of Nature." By the Rev. J. Montgomery. Nimmo.

"Dr. Guy's Lectures on Public Health." Renshaw.

THE HORSE-SHOE RESTAURANT

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The Proprietor begs to inform the Public that beyond the usual fare of a first-class Restaurant, he has also a good daily supply of all Fish, and Delicacies of the Season, at the above rooms.

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Fish, Joints and Vegetables .....1s. 6d.
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And Dinners *à la carte*, according to prices specified in Bill of Fare.

THE

FOOD JOURNAL.

FOOD LEGISLATION.

LIGHT begins to dawn upon the darkness—a darkness derived, not as usual, from ignorance, but from our very excess of knowledge and civilisation,—and we hail with the utmost pleasure the admission made by the Home Secretary, on the evening of the Food Adulteration debate of May 27th, that great evils existed, and that it was the duty of the Government to remedy them. Indeed, it has seemed to us a surprising anomaly that, while other branches of the sanitary economy of the country were carefully looked after, that of the important question of food has been deemed worthy of little or no attention, although notoriously the one in which most evils have existed.

The Privy Council takes cognisance of public health in its medical aspect, and a Sanitary Commission is now sitting to investigate the existing machinery and the whole sanitary code of the country; but, strangely enough, little or no mention is made in it of our food and drink, which, when abused, are to a great extent responsible for the very evils which that Commission is intended to remedy. Our rivers are being carefully watched, our air tested, our water supply regularly noted as to quantity, and analysed as to quality; but our food (in which we include our artificial drink) has been for a length of time protected only by an Act which, by common consent, has been deemed a dead letter. While foreign countries of less degree than ours are showing us the way to a proper organisation, John Bull prefers to be bullied, robbed, and poisoned, with his eyes (and his mouth) wide open. But we trust that the time is fast approaching, when a better appreciation of what is and what ought to be shall exist in the minds of the general public and its rulers. Indeed, it is high time that we awoke to a sense of our shortcomings, for not only is the health of the community visibly deteriorated by the slow poisoning to which

it is subjected, but the moral condition of the country is undergoing the same insidious lowering—a lowering, be it remembered, which is as fatal to our commercial reputation in great things as in small. The tradesman who systematically adds salt or water to his milk is as bad in his way as the respectable Company that doctors its accounts. Some people may argue that it is not fair to judge a whole class by isolated cases of adulteration; but we maintain that, just as a single spot of red betokens the burning fever of the system, these discovered cases of adulteration are only the signs of an indefinite amount of evil under the surface. In fact, we have become so warped, that many people concerned in the production of food have a tendency to lose sight of what adulteration really is; and to this we fear that the remarks of the President of the Board of Trade have contributed. They argue that, as long as the mixture is not one of pernicious and injurious articles, it ought not to come within the law. Nothing can be more fallacious than this reasoning, for it is patent that adulteration consists in the addition of any material which leads the consumer to believe that it is the genuine article, which it is not. We are quite ready to admit that there are some preparations of food or drink that involve, or are all the better for, some admixture; but in these cases the nature of the preparation should be specified, so that the purchaser may know what he is buying. As a thorough examination of the subject is promised us, it would be premature to speculate too closely on the form that the new Act may assume; but there are certain points, the embodiment of which, we may be permitted to show, will tend to make the legislation more valuable; and, as a broad rule, it should be compulsory, and not permissive. The last Act provided that towns *might*, if they chose, appoint analysts, and the consequence was that only some eight or ten in all England availed themselves of the permission; so that for the real good that was done, the permissive clause need not have been inserted. The whole system under which such an Act should be worked should be imperial and imperious. Not only should the appointment of analysts and inspectors be compulsory, but they should not be entrusted to the dubious choice of corporate bodies, vestries, or parish boards, a large number of the members of which are implicated in contracts with the guardians and charitable institutions.

Apropos of these contracts, and especially union contracts, we would suggest that the inspectors should have powers given them to investigate and report upon them; for we are well aware that short weight and adulteration are by no means uncommon items in the creeds of the gentry who undertake them—as witness the pro-

ceedings of the Oxford magistrates against the bakers of that union, reported in the last number of the "Food Journal."

The appointment of the officials by Government would give them a freedom of action and opinion that they could never hope to attain under local authority, which, good as it may be in many ways, would not work well in this particular. They should of course be subject to the strictest supervision by a central authority in London; and this authority should not proceed from any hazy connection with the Board of Trade, but from a well defined sub-department, which should embrace and deal with all questions of food supplies. Such a department would naturally come under the Minister of Agriculture, as lately suggested by Mr. Hyde Clarke. There would be plenty of work for its members. Cognisance would have to be taken of all cases of food adulteration, bad meat, and the importation from abroad of spurious articles of diet; and, in the latter case, this department might undertake proceedings *ab initio*. A petty dealer or small shopkeeper may sometimes unconsciously retail an impure and adulterated article. The onus of disproving complaints, or knowledge of the fact would, of course, lie upon the retailer; but, if he could satisfactorily show that he acted in good faith and in ignorance, it would, we think, be fair and right that the Food Department should take the matter up, and prosecute the manufacturer or importer.

As regards punishments by fines, we have no faith in their being either too small or too large. A magistrate seldom inflicts a maximum fine, especially if it is a large one; and, moreover, there is that kindly fellow feeling, admirable in itself, which prevents people giving information, so as to lead to the conviction of a fraudulent tradesman. Some have known him so long, and he is a kind man at bottom—others are timid of giving offence to the neighbourhood; so that, what with one thing or another, the sinner either goes scot free, or else pays a small fine; as happened in Gloucestershire, where a baker, on conviction, paid his 5*l*., saying that he could make it up again in a week. If fine there must be, we would have no sliding scale, but a well defined and tolerably round sum at the first offence; while the second offence should not only be visited with a fine of treble the amount, but an "affiche" above the shop door should inform the passers-by of the offence and the punishment. The local papers should also be obliged to insert it (at the tradesman's expense), and copies of the announcement be kept for six weeks on the doors of the church, the market house, and the police station. For the third offence, imprisonment for one month, with hard labour, would not be at all too severe.

The inspectors and analysts should at all times be empowered to demand a sample of any article on sale. This would, of course, be denounced as an arbitrary act, but we cannot see with what justice. The inland revenue officer walks in and out of every brewery and malt house to see that the Customs are not defrauded. We think that it is to the full as important that equal powers are provided that the public be not defrauded.

Under some such system as this, we may perhaps eventually indulge in the pleasing hope that working men may drink a decoction of malt and hops without the mixture of salt, which makes them thirstier than ever; cocculus indicus, which stupifies them; or even water, which is so very much nicer by itself. We may perhaps get our butter without the admixture of grease or starch, our coffee without chicory or roasted grain; and we may, if ever that happy time comes, dispense with our blue pill, or, if we have to take it, find that it is something better than slate pencil filings.

Phillips Bevan.

We may theorise on food now-a-days with much astuteness; but what theory will give us back the appetites enjoyed in the good old days of yore? Our modern cooking is more refined; all manner of high flavours excite our appetite, and yet we cannot eat as they were wont to eat. It is a melancholy fact to think of which makes us sad at heart. Here are, for instance, a few extracts from a certain household book, or diary, written by the Earl of Surrey, in 1523. On the 6th of August in that year, the Earl, as was his habit, dined in "his lady's chamber." This was but an ordinary dinner, consisting of two messes, at one of which all the servants partook. The guests few in number—only "The Dukys Grace of Norf, the Duches, my Lady Oxforth, my Lady Elsabeth, my yonge Lady, my yonge Lord, my Lady Wyndham." This was the simple, but substantial fare:—"Fyrste cowrse.—ij capons bowled, and a breste of mutton and a peyse of beyf, vij chevetts, a swane, a pygge, a breste of veyle, ij capons rost, a custerde. Seconde cowrse.—iiij messe of morts, vj checkyns, viij pegeons, iij connes, ij shovellers, iiij sepyes, j dos quals, ij pastys of vennyson, a tarte, notts and peres. To the bordshend.—A capon bowled, ij rebbs of beyf, a swane, v chevetts, a breste of veyle, a capon rost, a custerde. The seconde cowrse.—iiij checkyns, ij connes, vj pegeons, vj qualys, a pasty of vennyson, a tarte, notts and peres." But, perhaps, the most conclusive evidence that we can give of the good appetites prevalent in those days, is the active part enacted by the ladies at table. On October the 24th, we find it related in the same diary, that two ladies were served for their breakfast as follows:—"To my Lady and my Lady Wyndham, a peyse of beyf, a gooyse, a breste of veyle rost, a capon." This is decidedly good fare for a breakfast only. Few ladies could manage as much now; but, after all, it is perhaps fortunate, as ladies' appetites for dress and other expensive things have not abated, so that they can no longer consume a piece of beef, a goose, a breast of roast veal, and a capon—just for breakfast.

HOW FOREIGNERS LIVE IN LONDON.

The title of the "Food Journal" will in itself suggest that, in alluding to foreigners, I have only to dwell on matters relating to their alimentary contrivances. But with them, if not with Englishmen, there are surrounding circumstances necessary to make a meal agreeable, apart from the material substance consumed or the style of utensils employed for that purpose. The dinner table should be fraught with abstract associations likely to content the mind, while the food satisfies the body. I feel myself, therefore, compelled to describe not only the fish, flesh, fowl, and vegetables consumed by the foreigner, but the general social tone which pervades his favourite haunts. And now, having said this much, I will, so as to economise my limited space, avoid further preliminary remarks, and immediately introduce the reader to one of the most interesting café restaurants of Soho. This is the Albergo di Venezia, in Old Compton Street. It has two small bow windows, and the wayfarer will be immediately struck by the absence of the dirty pint coffee cups, and the shoals of dead flies which generally ornament the windows of eating-houses in the neighbourhood. In one window is a dessert plate containing a few bright oranges, and by its side another with some light and neat biscuits de Rheims elegantly piled upon it. The dead flies also are removed daily. On the other side, for sole ornament, are a few flowers, and a tall blue board, bearing on it the names of innumerable dishes, with their prices drawn in white. Curtains placed behind hide the interior from the public gaze. From the outside the café looks poor enough, though I have sufficiently described this point of view to prove that it is more attractive than English eating-houses of an equally modest description. On entering, let us say at eleven o'clock on a Sunday evening, a very curious sight presents itself to the view of the startled Englishman. It is a small, narrow room, with a window and fire at the extreme end, and a clean counter; behind it are shelves containing numerous bottles, neatly assorted, of Vermouth, Italian wines, and champagne, while on the right is a row of little tables. The atmosphere is intensely hot as compared with English houses, and clouds of tobacco smoke float gracefully to the ceiling, which, unfortunately, is not a great

distance off. On all sides are dark, swarthy faces, with the sombrero slouching over the eyes, and the ample cape thrown with consummate dignity over the shoulder, covering on its way the chin and mouth. Many faces look emphatically dirty, others are of a romantic and handsome type, while some bear the unmistakeable traces of bitter disappointment and untold hardships. Yet what life, spirit, gaiety and animation, teem on all sides from this motley crew. At one moment we hear the melodious and lively *roulade* from an Italian opera, well and freely sung, in the exuberance of his spirits, by some member of the chorus of Covent Garden opera house. The next instant a little man, with sharp face, bright eyes, and animated gestures, springs to his feet, and, with the full strength of his lungs, and the easy flow of his native Italian, hurls every possible anathema against the burly head of Victor Emanuel, boldly resorting to occasional quotations from the words of Mazzini,—his so-called "prophet." Next to him will sit an old Italian bookworm, pondering over a huge dictionary, which he affectionately carries about him, as if it were part and parcel of his existence. This thoughtful and venerable face is not unknown at the reading room of the British Museum. Further on, is a man with a broken hat, and his clothes more shabby than all the rest. To him, however, all honour. The poverty of his apparel is no criterion wherewith to judge his mind. I have heard him take the lead in many deep and intellectual conversations, and never found his knowledge of any important philosophical work at fault. But I should absorb every leaf of this month's issue were I to attempt to depict all the interesting characters to be met at this haunt.

The most important and the most attractive feature of this café is the friendly relations which exist between its frequenters. For the most part they are all well acquainted with each other; but yet, if a stranger enter who can speak French or Italian fluently, and for the moment divest himself of his gawky English reserve, he will be treated with the same kind, though respectful familiarity, which makes all the other customers feel so much at home. It must be borne in mind that the etiquette of this place is founded on strictly democratic principles. The cook, the scullery maid, the lady at the counter, and the customers are all equals; all are treated with equal respect and equal friendliness. If you have occasion to speak at any length with one of the waiters, he or she will take a chair and sit down by the side of you to await your good pleasure. And yet the most fastidious aristocrat could hardly object to this license, for anything truly vulgar is rarely seen in this café. Those repulsive oaths so common among the poor of England are utterly unknown

here. A mild *carrajo* or a *Corpo di Bacco* alone lends emphasis to the conversation. Again, if you establish yourself as a regular customer, the café is ever at your disposal, without, as in English houses, your being compelled to take something. I know a poor chorus singer who comes nearly every day with her sewing, and sits working and chatting for hours together without taking anything, save occasionally a very modest meal, and yet she is always treated with kindness and respect, alike by host and customers. At Christmas the proprietors of this café give a grand dinner, free of all charge, to their regular customers; and many an Italian exile has thus spent a merry Christmas day,—while had it not been for this thoughtful hospitality, he must have passed the evening alone, dull and friendless, in some poor garret.

Such facts as these have naturally drawn many customers, but they alone would not suffice. It is necessary to examine the bills of fare, of which there are two,—one in French, the other in Italian,—both about half-a-yard in length. One day I counted how many different dishes there were from which I could choose, and found 36 articles inscribed. On another occasion there were 52. This calculation made me conceive the idea of ascertaining more minutely the size of the restaurant for which so many dishes were provided. I counted, and found in the room 24 available seats, but have rarely seen more than ten persons dining at once. Thus the choice is most abundant in comparison with the custom. Now, out of these 52 different articles, none were charged dearer than 6*d*., excepting the omelette au rhum or au confiture, for which 7*d*. is demanded; chicken, when cooked with mushrooms, ranges between 8*d*. and 10*d*. the plate; while filet de bœuf aux champignons is 9*d*. Having mastered these facts, I proceeded to many experiments, and came to the conclusion that, with the exercise of some ingenuity and management, I might invite 20 persons to dine with me at this little restaurant, and yet give them each perfectly different and distinct dinner. At present, however, I will content myself with suggesting how two persons might test the greatest quantity of Italian dishes at the least possible cost. For *hors d'œuvre* I should order some of the famous Italian sausage called *mortadella*. One portion will suffice for two persons, and costs 4*d*. The soups I can hardly recommend, as they are too weak, at least for the English taste; but they only cost 3*d*., and the solid macaroni, rice, or vermicelli with which they are mixed compensates for their pristine limpidity. As a second dish, I would substitute tagliarini for soup. This is a paste which, I am told, can only be obtained fresh at this house. It is very like macaroni, but

more delicate in flavour, and a new supply is made every day by the "illustrious" cook and proprietor, Signor Rossi. I say illustrious, because he is much thought of among his swarthy customers, and is supposed to have won laurels at the Union Hotel in Cranbourn Street. Indeed, there was a rumour spread that he had been cook to Count Cavour, but this must be confirmed before it is relied on. In any case he is a clever man to make so little go so far. One portion of tagliarini is ample for two persons, and the charge is 6*d*. Fish is much the same as in French restaurants. A plate of bouilli, or boiled beef, with vegetables, can be obtained for 4*d*., but this is very dry, and I should recommend our passing to the fifth chapter in the bill of fare, entitled *fritti*, or that which is fried. As especially Italian, one helping divided, in two, of kidneys *sautés* with mushrooms, will serve as a relish, price 6*d*. The entrées are nearly all French, such as ragout de bœuf aux pommes, veau farci au pois, fricandeau épinards, etc.; but there are the cotelettes milanaises, and the stewed steak, with green peas (each 6*d*.), that are Italian in their style. Let one helping of each be ordered. Then, passing over the dandelion salad—for we cannot have everything at once—as something essentially foreign, let me suggest one plate of artichokes cooked with oil, garlic, and parsley, and one plate of the same vegetable, cooked with cheese and butter, each at 4*d*. The whole should then be capped with gorgonzola cheese (2*d*.), and I maintain that this is a thoroughly foreign and varied dinner for a very low price. Adding bread, 1*d*. each person, a bottle of common but drinkable claret at 1*s*., we come to a *total* of 4*s*. 6*d*., or 2*s*. 3*d*. per head for the dinner.

Thus I have first shown that there is a local air about the Albergo di Venezia likely to please the Italian and remind him of his own native land. Secondly, the style of food is equally suggestive. Both the mind and the body, therefore, can be satisfied at once. Other interesting details concerning Italian food I will reserve for my next article, together with the description of some very curious French and German eating-houses. Now I can but open the subject; but before I have finished it, I hope to prove how much Englishmen have to learn from the way in which foreigners live in London.

Adolphe Smith.

[to be continued.]

AFRICAN FOODS.

No. 2.—The Manatee.

The manatee, although partially, if not mainly, an inhabitant of the ocean, is truly a pachydermatous animal.

We believe that the African manatee (*M. Senegalensis*) is to be met with at intervals at the mouths of the rivers all the way round from Senegal to Mosambique. This need not surprise us, notwithstanding the long space about the Cape which is without rivers, for it is so far a roving animal (at least, an animal capable of wandering far), that it has been taken or cast ashore on the coasts of Britain, and even as far north as Shetland.

Dr. Barth and the unfortunate Dr. Vogel found what they thought might be a second species in the river Binné, and this Professor Owen provisionally named *Manatus Vogelii*. Dr. Vogel thought that it was not very common, only some twenty or thirty individuals having been taken in the Binné during the whole season that he was there. Indeed, the manatee seems nowhere to have been common; and until the missionaries at Old Calabar sent home a few skulls, it was one of the rarest creatures in museums. Dr. Vogel only got one specimen, and Dr. Balfour Baikie found a head in a Dju-dju, or sacred heap, near a miserable village on one of the interminable dreary creeks at the mouth of the Niger. It is a royal perquisite, like the sturgeon in Britain, and is generally taken to the chief's table; but none of my missionary friends seem to have tasted it. Dr. Vogel, however, speaks of it as very good, its flesh and fat being like pork, and very well flavoured. There is no reason why it should not be so. It is herbivorous, feeding on sea weeds when in the sea, and on grass, etc., when in the rivers or marshes. It reaches 10 ft. in length, and becomes very fat. We know, too, that its near relative, the now extinct *Rhytina Stelleri*, during the short period which elapsed between man's discovery of it, and his eating it off the face of the earth (it was discovered in 1741, and the last survivor was consumed in 1768), supplied a large store of what is described as most excellent food to the whalers who annually wintered at Behring's Island, where they congregated in numbers for the purpose of economising their stores, and feeding on the fresh supplies which that animal afforded. A similar fate probably awaits the manatee, although its wider distribution no doubt gives it a longer day.

Andrew Murray, F.L.S.

FOOD AND TRADE MUSEUMS.

Some may consider the establishment of Food Museums one of those crotchets of dilletantism and over refinement which have but little practical utility. These institutions, without making great pretensions to popularity, are, however, of great value for popular instruction, as well as for scientific reference. A museum may, it is true, be set up for anything, but the formation of the food collection at South Kensington was carried out from materials then existing.

It is of great use to teach the public occasionally the importance of food production and economy, and the variety of materials applied by the several nations of the earth. This is always a matter of popular interest, because there are many curious objects which enter into such a gathering, and these naturally draw forth comments from visitors. Then, so far as trade is concerned, the great part which articles of food contribute to it is necessarily illustrated; and it is often requisite for persons engaged in trade to refer to these collections for inspection of specimens. This is, however, only a part of the scientific uses which are served by a food museum. The chief museums for these purposes in London may be considered to be South Kensington, the East India Museum, the Museum at Kew, the Museum of Economic Botany in the Botanic Gardens, Regent's Park, and the private museum of Mr. Twining. It is, however, only the collection at South Kensington which is special; the other museums only furnish casual illustrations, as is the case in the Crystal Palace. It is to be hoped that the new East London Museum at Bethnal Green will include a series of food collections, as these will materially contribute to the public interest.

With regard to our large commercial ports engaged in the export trade, such as Liverpool, a food series is an essential portion of the local museum, because it is, in fact, a part of a real trade, an economic museum, such as it is to be regretted we have not yet acquired. Under such a provision the food collections would be suitably placed as a part of the whole; and it is in this respect

that the subject of a trade museum in this commercial metropolis is referred to. For such a collection we have many of the elements, but not what we ought to have. In Jermyn Street we have what was instituted as a Museum of Economic Geology, in the Botanic Gardens at Kew that of economic botany; but we have none for economic zoology, though there are scattered collections. The Indian Museum is to a great extent an economic museum, and its collections of fibres and fabrics have done good service. In South Kensington there are also other scattered collections.

The Great Exhibitions were to some extent economic museums; but we still want a great trade museum, in which the food collections will be included, and to which can be sent for inspection all new substances for food, and all new materials for manufacture. The acknowledgment of the want of such an establishment has led to our present fragmentary collections, and it is to be hoped that we shall not have to wait long for better organised arrangements.

Hyde Clarke.

The Australian meat sales appear to progress, and have been extended to Liverpool, by which a fresh centre of operations has been secured. It is satisfactory to find that the demand increases, notwithstanding the opposition and denunciation of interested parties. We learn, from a Liverpool correspondent, that a tradesman there, who had been refused the agency for the preserved meat, was spreading a report that he had made an offer for 40 tons of it for dogs' meat. We trust that the public will be on its guard against unscrupulous assertions such as these, and will insist upon judging for itself. Our own experience is decidedly favourable to the tinned meat, such as the Australian boiled mutton; although housekeepers should not neglect to take the common precaution of not keeping a tin open too long. A complaint has been sent to us of a Cheltenham tradesman, who has been in the habit of selling portions of a tin piecemeal, and thus allowing the latter portion of it to become perfectly unfit for food. By such absurd proceedings, an unjust impression is created amongst purchasers, and a most important food supply gets a bad name in the market.

Another plan of importing meat from Monte Video, proposed by M. H. Yobes, consists in having the holds of vessels lined with metal, and covering the bottom with straw, sawdust, bran, or some other nonconductor of heat, upon which the meat is to be laid. A layer of ice succeeds, and then more straw; the process to be repeated until the hold is filled, when it is hermetically closed. We fear that the result would be similar to that in the experiment of the "City of Buenos Ayres," in which the meat had to be thrown overboard, before the vessel was thirty days at sea.

HOUSEHOLD EDUCATION FOR WOMEN.

AMONGST the many questions that are being agitated concerning the proper forms of education for women, we must not lose sight of the great importance of instruction in the housekeeping, food, and cookery departments. There are many women who, while repudiating or ridiculing the necessity for a higher education in other matters, are no less scornfully ignorant of what ought to be a very important part of every woman's knowledge. There are other women again, who, in grasping earnestly the higher, lose sight of the lower, but not the less appropriate, part of their education. When we consider this subject carefully, in relation to every woman's life, we find that in no instance can the knowledge of housekeeping and cookery be dispensed with. The only women—few and far between, in comparison with the number of other women—who *might* be able to dispense with this, are those who are so wealthy that they can afford the luxury of a housekeeper; but even these may be plunged into poverty some day, and then the requisite knowledge of practical things will not come badly to them. Besides, as no woman can be certain that she will be thrown into that particular sphere, it is well in early youth to accustom every woman to look upon life as a practical reality,—not to be dreamt away in idleness, and contempt of the lesser daily duties. This knowledge can be inculcated before the higher branches of education are reached, and it ought to form part of the programme of every girl's school, as well as of instruction at home. There would be ample time for it, for there are accomplishments which are insisted upon for girls, whether they have a talent for them or not; and they would be much better employed in acquiring more practical forms of education. It does not necessarily follow that, because a woman has a fair amount of practical knowledge, she must lose all feminine sweetness, and become a mere household drudge. On the contrary, the so-called household drudge seldom knows anything of the *science* of cookery and food. And this knowledge, far from interfering with higher education, in any form or phase, is a real necessity of that very movement for opening fresh employments, and for the more technical education of women.

First, we will suppose that a woman has been well educated, and that her lot in life is to be married, and that she is not one of the exceptionally wealthy ones. Will she not be the better wife for a knowledge of the physiological properties of food, and of the best mode of cooking the same? If she does not know what is the fault of the ill-cooked viand that her cook sends up to table, how is she to direct her to rectify it for next time? And frequent repetitions of bad cookery are sure to put her husband in a bad temper, and perhaps drive him to his club, so that he may get a good dinner! He will most likely blame his wife for not being able to direct the cookery department more wisely. As a rule men care more than women do for good cookery; and, assuredly, it should not be considered beneath a wife to see that her husband's home is made happy, and that her household is well ordered in all things.

So then with a view to matrimony alone, every woman should be taught domestic management, and in her turn she ought to instil that knowledge into the minds of her daughters.

We will suppose, however, that a woman—and her name is Legion!—has no husband to please, or household to order, but that she is going to enter upon the medical profession, or to be hospital nurse, matron or superintendent of any public institution, a housekeeper, or a sister of mercy, or that she is going to emigrate. Will she not require culinary knowledge for every one of these things?

First, as a physician, she must know what is good or not good for her patients; for, if she be anything of a successful practitioner, she will find that diet is everything in many diseases. As a matron, superintendent or housekeeper, she must know how to direct the servants under her; and both in hospitals and schools the quality and mode of cookery of food is very important, and in many cases not sufficiently attended to. As a hospital nurse, she will not be the worse for practical knowledge of what she is administering to the patients; and, as a sister of mercy, it is equally important that she be qualified to instruct the poor whom she visits, for they might often be better and more wholesomely fed by the mere knowledge of how to utilise the small means they possess. And if a woman means to emigrate, it needs no argument to prove how idiotic she will be to undertake a colonist's life, without that most necessary practical knowledge of domestic economy.

We see then that, in every station in life, the knowledge of the quality of food, and how to cook it, is very essential to womankind,—to enable them to make others happy and comfortable; by qualifying them to detect adulterations or bad qualities of food; and to prescribe the best food for sick people under their care.

It is a great cry of the age that servants are not up to their work, and it is mainly because so little trouble is taken to instruct them early in youth in the forms of service. It would indeed be a very good thing if our idle women would but undertake to instruct the poor in the practical duties of domestic life. Much illness and misery might be saved, and better servants secured to the community; and no woman should think it beneath her—be she as learned as any man living—to acquire a knowledge of the laws of health, and how that health is affected by good or bad food and cookery.

Emily Faithfull.

COST OF LIVING IN PARIS.

The house painters of Paris have struck for an increase of wages, and the following is an account of the cost of living for a working man, his wife and two children, in Paris, drawn up and read to a public meeting by the Secretary of the Workman's Association. Converted into English, the items are:—

	£	s.	d.
Rent of two rooms	12	0	0
Workman's breakfast, away from home, 7½*d.* per day for 337 days, of which 169 average only 7½ hours	10	2	3
Ditto do. at home on Sundays, &c., 28 days	1	2	6
Breakfast of wife and two children, 4*d.* each, for 365 days	17	10	6
Dinner for whole family, four persons at 5*d.*, for 365 days	29	4	0
Clothing per annum	8	0	0
Sugar, 1 kilogramme (2¼lbs.) per month, at 1*s.* 1*d.*	0	12	6
Soap, 1½ kilogrammes per month	0	18	10
Firing during four months of winter at 3*d.* per day	1	9	0
Charcoal for cooking during eight months, 6 bushels per month	1	9	4
Cheap oil for lighting, 1 lb. a week for six months, and ½ lb. for the rest of the year	1	4	2
Shoes and sundry expenses	3	7	0
	£87	0	1

The workmen assert that, taking into account the time lost in winter, they can only calculate on the average on 295 working days of ten hours per annum, which at six francs, or 4*s.* 10*d.*, the present wages of the first class of painters, only yield them the annual sum of 1770fr. (70*l.* 16*s.*)

It is right to add that some of the items in the above account have been criticised as exaggerated, but there is reason to suppose that the truth is not far exceeded.

POPULAR FOOD ANALYSIS.

No. 6.—CONFECTIONERY.

"CONFECTIONERY, ugh!" says Fogle, as he opens the present number, "what is the use of bothering about sweets? Why not be useful, and let us first look into bread and the necessaries of life? In my opinion the worse the sweets are, the better, as there would then be fewer squalling brats in the world!" But it is in the interest of these British brats that we take up the subject thus early, seeing that the child is father to the man in a hygienic as well as in a psychological point of view. Then again, sweets are undoubted necessaries of infantile life; for what would the nursery be without those lollipops of tempting colour and delicious flavour, at once so useful and so troublesome to the domestic authorities? How many times is the noisy and petulant youngster lulled to peace by the spreading out of a sweetmeat feast, price one penny? But yet, when Uncle John comes to see Tommy, and tips him half-a-crown, which is spent at the confectioner's shop within three days, think of the mother's anxiety, for she well knows that such visits invariably end in "the powders as before," and "the castor oil in the morning." It is not to be denied that an overdose of pure sugar will itself cause some of the ills to which infantile flesh is heir; but why is it that, after eating a few only of these beautifully coloured sweets, our child should always suffer the pangs of colic, although he often surreptitiously abstracts twice the quantity of loaf sugar from the cupboard, and is none the worse for it? The answer has already been given by many authorities, to the effect that there is no more unblushing and licensed poisoner in the world, than the unscrupulous manufacturer of cheap confectionery. It is a well recognised fact that it is possible to produce coloured sweets without employing any deleterious mineral ingredients, but the cheapness and pigmentary power of the latter are considerations which easily overcome the conscientious scruples of these gentlemen, if indeed they really possess a conscience at all in matters pertaining to their trade. We propose to take up the various colours in the order of their popularity, and simply to classify them into six groups, viz., red, yellow, blue, brown, green and white, without distinguishing them exactly by shades. Our results will be gathered from the examination of 105 samples of various kinds of sweets, both cheap and dear, purchased at random all over the metropolis.

partaken of highly coloured ginger lozenges in large quantity, to allay flatulence, as he fancied. The commencement of the action of the poison manifests itself in sudden attacks of excruciating pains in the bowels, and other signs of what is known as *painters' colic*. The patient becomes worn and thin, while tremblings of the hands and pains in the legs and feet follow. At last it becomes impossible to hold anything, or to stand without assistance, and a kind of paralysis sets in, characterised by what is called "wrist drop." The patient is now a pitiable sight, with his hands hanging like inanimate masses of flesh at right angles to his arms, without the power of raising them; while a well defined blue line is visible all round his gums, and, if relief be not obtained, a miserable death soon follows. Such then is the risk to which we expose our children, in permitting the use of chromate of lead as a pigmentary matter in sweets. Many children are at this moment suffering the torments of this colic in London, and having their cries stilled by gifts, on the part of their tender though foolish mothers, of the very matter which is ruining their health and embittering what should be the happiest portion of their existence!

As to the detection of poisonous yellow comfits, we will refer to our remarks on the reds, and simply say to our readers that they ought not to permit the use of yellow comfits in their families at all; but, if they do so, they must especially beware of those which, when dissolved in water, leave behind a distinct heavy bright yellow powder at the bottom of the glass.

3. *Blue coloured confectionery.*—Twelve samples out of the 105 were coloured blue, so that this tint is evidently not so popular as the ones already considered. There is only one blue pigment which should be permitted to be used, and that is indigo, while the following is the *list of colourings which ought to be prohibited*:—Ultramarine; Blue Verditer; Prussian Blue; Cobalt Blue and Smalts; and all modifications of these pigments.

On examination the twelve blue sweetmeats gave the following results:—

No.	Name.	Deleterious Colouring.
4	Hundreds of Thousands	None.
5	Rifle Shots	"
8	Mixed	"
10	Sweet Marbles	"
11	Mixed	Ultramarine (false).
19	Lozenges	Copper.
17	Ornaments	Ultramarine (false).
24	Mixed	" "
30	Peach Stones	" "
41	Purple Ice	None.
42	Mixed	"
43	Seed Gingerbread	Cobalt.

This table shows us that out of twelve samples six were coloured with deleterious pigments, which, although not as a whole so actually poisonous as the yellows, yet are still far from pleasant additions to our food.

4. *Brown coloured confectionery.*—These sweets come next in popularity, as there were twelve brown samples. The colour is usually produced by the use of some brown earthy matter containing iron, and is not as a rule very actively deleterious. However, it would be better to forbid the use of brown pigments altogether, and only permit this tint to be communicated to sweets by the use of chocolate, coffee or some such matter. Of the twelve comfits examined, seven were so coloured, the rest being principally tinted by umber. The following table shows the results:—

No.	Name.	Deleterious Colourings.	No.	Name.	Deleterious Colourings.
5	Balls (sweet)	None.	32*d*	Cream Ice	None.
8	Mixed	Iron.	32*g*	Cream Balls	„
26	Sweet Nuts	„	39	Black Currant Lozenges	„
29	Jordan Almonds	„	40	Mixed	Iron.
32*b*	Cream Ice	None.	41	Chocolate Ice	None.
32*c*	„ „	„	42	Coltsfoot Rock	Iron.

5. *Green coloured confectionery.*—This tint, although pretty and attractive, is evidently not popular, as only five of the 105 samples were green. It would therefore seem that the great number of warnings which we have had, from time to time, as to the danger of such pigments, have caused the public to become shy of them. This has not been without good cause, seeing that nearly all the mineral greens contain copper, while the brightest one (Scheele's green) superadds the charms of arsenic to those of the former sufficiently dangerous metallic poison. The only green permitted to be used should be a mixture of indigo and a vegetable yellow such as turmeric. Sap green is also allowable when unadulterated by any mineral matter, which is, however, a very uncommon circumstance. The following greens ought to be strictly forbidden:—Verdigris; Scheele's Green (copper arsenite); Brunswick Green; Zinc Green (zinc and cobalt).

All the green confectionery was found to be coloured with one or other of these poisonous ingredients. We therefore counsel our readers to stick to their abhorrence of green sweets; and never, under any circumstances, to allow such comfits to be used in their families.

J. Muter, Ph.D.

[to be continued.]

THE MEDIÆVAL CLERGY.

IN the last number of the Journal, the little peculiarities of the monks of old were pointed out, showing what a decided leaning they had towards the cultivation of gastronomic art, and what exceedingly pleasant fellows they could be when they liked. But this style of enjoyment was by no means limited to the monks or regular clergy; for those of the secular order were to the full as magnificent in their ideas, and as appreciative of the good things of this life. Indeed, the style in which public occasions were celebrated by the higher dignitaries was more than royal, and the accounts of the enthronisation of Archbishops Neville and Wareham are perfectly bewildering in the number and variety of the banquets, though at the same time they must have been as tedious as they were splendid. A most amusing story is told in "The Arte of Rhetorike" of one of these long drawn out feasts, given by the Archbishop of York:—"An Italian, having a sute here in Englande to the Archbishoppe of Yorke that then was, and commynge to Yorke, when one of the prebendaries then brake his breade, as they terme it, and therefore made a solemne large dinner, the whiche perhaps began at eleven, and continued well nigh till fower in the afternoone, at the whiche dinner this bishoppe was. It fortuned that, as they were sette, the Italian knockt at the gate, unto whom the porter, perceiving his errand, answered that my lord bishoppe was at diner. The Italian departed, and retourned betwixte twelve and one; the porter answered, they were yet at diner. He came again at twoo of the clock; the porter told hym they had not half dined. He came at three o'clocke, unto whom the porter, in a heate, answered never a worde, but churlishlie did shutte the gates upon him. Whereupon, others told the Italian that ther was no speaking with my lord *almost all that daie*, for the solemn diner sake. The gentilman Italian, wonderyng much at suche a long sitting, and greatly greved because he could not then speake with the archbyshoppe's grace, departed straight towards London; and, leavyng the dispatche of his matters with a dere frende of his, toke his journey towardes Italie. Three yeres afterwards, it happened that an Englishman came to Rome, with whom this Italian by chance fallyng acquainted, asked him if he knewe the Archbishoppe of Yorke. The Englishman

said, he knewe him right well. "I praye you tell me," quoth the Italian, "*hath that archbishoppe yet dined?*" There is a charming irony in this question, worthy of Dr. Riccabocca himself.

The Italian would scarcely have wondered so much at the length of time consumed over the repast given at the enthronisation of Archbishop Neville, if he had seen the bill of fare; for there were three courses of fish alone, embracing a much greater variety than even Billingsgate could furnish in our own day. The second course was the most profuse, and included—

Fresh salmon jowles.	Lamprey, rost.
Salt sturgeon.	Bret.
Whytynges.	Turbut.
Pylchers.	Roches.
Eeles.	Salmon, baked.
Mackerels.	Lynge in gelly.
Places, fryed.	Breame, baked.
Barbelles.	Tenche, in gelly.
Conger, rost.	Crabbes.
Troute.	

Under such a press of good cheer, eating and drinking became a serious process, so that one cannot feel much surprise that the lord steward of the entertainment, in sending in his little bill, inserted a claim "*ad sanguinem minuendum*," in other words, for being bled. Strange as it may appear, the churchmen were so much in the habit of systematically over-eating themselves, that they were obliged to have regular recourse to this safety valve, so as to throw off all chance of apoplexy. Indeed, Lanfranc, in his ordinances to be observed by the Benedictines, laid it down as advisable that the members of that order should be bled at least four times a year. They probably spoke of this salutary treatment as a wholesome mortification, but, in reality, it was a sanitary necessity.

Chaucer kept his sarcasm always ready whetted when he had to deal with the clergy—

"Withouten bake mete never was his house,
Of fishe and fleshe, and that so plenteouse,
It snewid in his house of mete and drinke,
And of all dainties that men couth of think,
After the sondrie seasons of the yere,
So changid he his mete and his suppere;
Many a fat partriche had he in newe,
And many a brewmen and many a luce in stewe.
Woe was his cooke, but that his sauces were
Poinant and sharp, and ready all his gere.
His table dormant in the halle alway,
Stode redy coverid all the longe day."

This life, however, was too pleasant to last, and the clergy became so fat and useless that they were good for very little else than

making out a bill of fare, and pronouncing upon it afterwards. Indeed, so excessive did their habits and expenditure become, that Archbishop Cranmer interposed a firm hand, and considerably cut down the cuisine of the reverend gourmands. He provided that an archbishop should not have more than six joints of meat, or, on fast days, six kinds of fish; a bishop might have five, an archdeacon four, and the inferior clergy three. One dish less all round was allowed for a second course, such as custards, fritters, cheese, apples, pears, etc. Of the larger kind of fish or fowl, there should be but one in a dish, such as crane, swan, turkey cock, haddock, or pyke. Of smaller articles, such as capons, pheasants, and woodcocks, two were allowed. The scale gradually increased with the diminishing proportion of the bird, for three partridges were permitted, and twelve larks or snipes. Unfortunately for this salutary code, we find the following memorandum tacked on to it by Mr. Leland, the antiquary:—"This order was kept for two or three monethes, tyll, by the disusyng of certaine wylful persons, it came to the old excesse." *Proh Pudor!*

A CORRESPONDENT from Liverpool mentions, amongst the food items of that town, the prosecution of two provision stall keepers—the one for exposing for sale green and putrid fowls which had been dressed for ten days; the other for selling the carcase of a pig which had died of scarlet fever, and was covered with an eruption of red blotches. The defendant, in the latter case, admitted that he had been told that "if he brought the carcase to Liverpool, he might be able to make something of it,"—and yet he got off with a month's imprisonment. As long as magistrates are so tender hearted to this class of offenders, we cannot expect much reformation.

MORE ADULTERATED TEA.—The sales of tea rubbish continue, two samples having been procured during the month, and submitted to Dr. Muter, who reports as follows:—"Sample No. 1, marked 'finest new season's Kaisow,' and sold from 1¼*d.* to 1½*d.* per lb. This tea consists of a mixture of tea refuse, and yields the enormous amount of 37·4 per cent. of mineral matter, chiefly iron filings. Sample No. 2, marked 'fine Oaufa congou,' and sold at 1¼*d.* per lb. This is a mixture of re-dried tea leaves, straw, fragments of matting, rice husks, willow leaves, and, in a word, seems to have been manufactured by simply drying up almost anything that came to hand in the shape of vegetable substance. The samples also contained fragments of a matter closely resembling the excrement of silkworms. I do not consider either tea fit for human consumption." Looking to the number of reports such as these which we have received as to the quality of teas lately sold in bond, we intend very shortly to take up the subject, with the view of ascertaining how far this rubbish has reached the hands of the retailers; and we hope to present our readers with a full report in an early number.

OUR FOOD IMPORTATIONS.
SUGAR.

AMONG the many articles imported into the United Kingdom every year, sugar is certainly one of the largest in bulk and value. It is difficult to realise the fact that we import annually upwards of 1,400,000,000 lbs. of sugar—refined, unrefined, and molasses—of the value of 16,000,000*l.*; that more than sixty countries, including British and foreign colonies, contribute to our wants; that 8,000,000*l.* to 10,000,000*l.* are embarked upon sugar by refiners in this country, and that this article alone has produced, hitherto, upwards of 6,000,000*l.* to the public revenue. On every account, both as an article of trade, and as a source of revenue, sugar well deserves our most careful attention as an import.

Sugar is by no means of recent discovery. It must have existed in China and India for a very long time, and probably it was produced there, almost spontaneously, in a wild state. The first writers who mentioned it called it Indian salt. A celebrated Roman physician of the name of Domitian said that, whilst by its colour and hardness it resembled salt, in sweetness it was like honey. As is the case even now with tea to a great extent on the Continent, sugar was used by the Romans for medicinal purposes only. With the importation of the cane, however, into Europe, either by the Saracens or by the Europeans on their return from the Crusades, sugar acquired a new and greater importance, as an article of commerce and industry. Landed first at Cyprus and Sicily, it was thence carried into Madeira, and at the commencement of the sixteenth century was transplanted to Brazil and to several Spanish West India Islands. Introduced into Barbadoes, under the auspices of a warmer temperature (sugar thriving best when the mean temperature is 76° or 77°), it speedily became a most profitable industry. The Caribbee Islands followed, and so great was the avidity to cultivate it that, labourers being scarce, and the work of cultivating the cane in so hot a climate by white men so very difficult, the idea suggested itself of getting negroes for the purpose, for which the slave trade was established on the coast of Guinea.

A good deal has to be done before sugar can be used to sweeten our articles of food and drink. Vast tracts of land are covered with a plant, eight to twenty feet high, having a thick stem, and long and narrow leaves of dark green hue. A host of coloured

men subject the cane to an enormous pressure, so as to extract the juice; which is made to run into large copper vessels or clarifiers, heated by steam, in order to separate the liquor from its impurities. When the clarification is complete, the bulk of the juice is reduced by boiling it in large pans, and is afterwards placed in concentrators or vacuum pans, till finally the sugar is crystallised; and, when separated from the uncrystallised portion, is put into hogshead, and sent thus to Whitechapel, Greenock, Liverpool, and Manchester. There the sugar is again liquified, heated, filtered, and concentrated; it is placed in conical pots with the apex downward, and with a hole at the lower extremity; and, finally, a small portion of saturated syrup of sugar, not clay as formerly, is thrown over the surface of the pots, so that its moisture may percolate through the mass and contribute to its purification, a process now greatly facilitated by the centrifugal machine. There are only about 70 or 80 sugar refiners in this country at present. The industry itself is of German extraction, and to this day a large proportion of the men employed in it are Germans.

But how is it that sugar planters do not attain, or try to attain, the maximum of excellence as well as the maximum of quantity? Why do they send us sugar with so much impurity, if by a little more labour and energy they can render it as good and pure as we can? How strange that, instead of completing the task, they should leave it only half done! What advantage they would have over our refiners in this country! But as well may we ask, why is it that India, where cotton has been an indigenous produce for centuries, has never succeeded in manufacturing it so cheaply and well as we can? Why is it that we can afford to buy up the raw material of cotton from America, pay the freight upon it, manufacture it here, and send it back again to compete successfully with the American manufacturers? The reason is very plain,—it is simply because we have extraordinary facilities and peculiar advantages for manufacture, which enable us to produce cheaper and better than any other nation. Compare the position of a refiner in the West Indies and in this country. There the machinery and apparatus are much more expensive, for they must receive them from this country. They have greater difficulty and expense in effecting repairs; they have to import coal from this country; labour with them is very costly and uncertain, whilst skilled labour is especially expensive. Capital again commands a much higher interest; the average rate in this country is less than 5 per cent., while there 10 to 12 per cent. is the nominal rate. Even water, so important in the manufacture of sugar, is quite scarce there as compared with this country. But independently of these disadvantages, the planter has plenty to do

to cultivate the land and gather the crops. And if, after he has attended to that, he attempts the manufacture of sugar, he can only refine the sugar from his own crop, and for so many months in the year—whilst in this country a refiner has the command of the market, and can work all the year through. There is no doubt that the sugar industry in the colonies is capable of much greater improvement, and that much progress may yet be made, both in the chemical processes and in the manufacture; whilst the economical management of the plantations, especially where slave labour obtains, is in the highest degree defective. Yet I do not think that, whatever they can do, colonial or foreign planters will ever successfully compete with the British refiners.

It was only during the reign of King James that sugar was honoured with a special mention in the British tariff, and for a long time the importation was but limited. At the commencement of the present century the quantity imported was 4,000,000 cwts., but it gradually increased during the middle of it to about 6,000,000 cwts., till now we import nearly 11,000,000 cwts. of refined and unrefined sugar and molasses. It is fortunate that for an article so largely consumed we are not, as we were in the case of cotton, dependent upon any one single country. For a long time indeed nearly the whole of the sugar imported came from the British West Indies, our colonial policy preventing them from sending their produce to any other country but Great Britain, and giving them on the other hand the exclusive monopoly of the British market. And when the slave trade was proscribed, and we set ourselves to discountenance it with all our might in every part of the globe, a new reason was afforded for our refusing to receive foreign sugar grown by slave labour. But such a policy was far too costly and injurious to be continued; however much we might have wished, not only by words but by deeds, to show our abhorrence of the slave trade. And as we found that, whilst we were depriving ourselves of large quantities of an article so much desired, we were not in reality checking the progress of the slave labour, we were in a manner compelled to allow the importation of sugar from all countries alike. This gave at once an immense stimulus to our imports of foreign grown sugar, and thenceforth the sources of our supplies have almost entirely changed. Professor Leone Levi, in an article in the "Food Journal," shows the enormous increase that took place in the importation of foreign grain sugar within the last thirty years. The following table will best show the change thus operated :—

	British West Indies. cwts.	Mauritius. cwts.	British East Indies. cwts.	Foreign. cwts.	Total. cwts.
1831-40 ..	3,400,000	580,000	240,000	480,000	4,700,000
1861-69 ..	3,670,000	930,000	430,000	5,670,000	10,700,000

The great object of bringing sugar as far as possible within the reach of all classes in this country has certainly been realised by recent legislation. An article, which enters so largely into the economics of the masses, need only be cheap to be extensively used. The rate of consumption goes *pari passu* with the cost of the article; it increases as it gets low, it diminishes as it gets high; whether the rise is caused by changes in the price or by higher rates of duty imposed upon it. So long as the average price to the consumer, inclusive of duty, was 70*s.* to 80*s.* per cwt., the average consumption was only 16 lbs. to 18 lbs. per head. When, by increased competition and lower duty, the average fell to 34*s.* 6*d.*, as in 1869, the consumption increased to 43 lbs. per individual of the population. In the same manner, the relation of low duties to the amount of revenue is very direct in an article of general consumption such as sugar. From 1800 to 1814 the average rate of duty per cwt. paid by the consumer was 26*s.* 2*d.*, and the average amount of revenue from duties on sugar of all sorts was 3,300,000*l.* From 1830 to 1844 the duty was considerably less, and the revenue ranged at about 4,500,000*l.* When, in 1845, Sir Robert Peel reduced the duties to 16*s.* 4*d.* for sugar equal to white clayed, and 14*s.* not equal to white clayed, higher duties being still charged on East India sugar, especially on foreign sugar, the revenue did not suffer materially. And when, in 1854, a still further simplification was adopted, the revenue from sugar rose annually till it reached, in 1863, 6,249,000*l.* In 1864 the duties were further reduced on sugars of all sorts, of whatever growth and whensoever imported, to 11*s.* 8*d.* if equal to white clayed, and other kinds in due proportion; in consequence of which a diminution of revenue took place, the amount in 1869 having been only 5,500,000*l.* It was in course of recovery, when, during the present session, another considerable change was made, Mr. Lowe, having reduced the sugar duties to 5*s.* 8*d.* per cwt. for first-class, 5*s.* 3*d.* for second class, 4*s.* 9*d.* for third class, and 4*s.* for fourth class, including cane juice. What effect this will produce on the revenue it is too soon to predict; but the consumption will doubtless be largely stimulated, and the revenue will gradually revive.

This is not the place to make any observation on the policy which dictated the financial measures of the last Budget, but it is difficult to perceive on what ground the Chancellor of the Exchequer preferred hazarding so large a sum of the revenue from an article which was already exceedingly cheap, rather than removing taxes of a much more burdensome character, and which would have proved a greater relief to the taxpayer. We might have welcomed this reform, had it been offered as an instalment of the complete

abolition of customs duties, or of the realisation of what Mr. Bright aptly called a free breakfast table. But Mr. Lowe is not prepared to admit the policy of such a course, and the reduction of the sugar duties appears to be a measure scarcely justified by the state of the revenue, whilst it is certainly inconsistent with the policy of making a wholesome inroad on the national debt. Apart from such considerations, we rejoice that sugar, an article decidedly a universal favourite, is thus placed within the reach of the poor as well as of the rich; and doubtless there is no better indication of the economic progress of the people, than the extended consumption of what may be considered a primary necessity to the comfort and well being of the masses.

Leone Levi.

[For table showing consumption of sugar since 1815, see next page.]

Ventilation of Hospitals.—A committee of the Paris Academy of Sciences is now considering this very important subject, and a communication from M. Cornill Wœystin has just been presented and referred to this committee. M. Wœystin criticises the present method of ventilation of hospitals, and asks how it is that, while certain doctors assert that a supply of eight to ten cubic mètres of air per bed and per hour are sufficient to keep a ward in good conditions of ventilation, others insist upon a supply of twenty, and even sixty cubic mètres, while some even fix eighty as the minimum quantity. He accounts for these immense discrepancies in the following manner:—In a ward containing, say, ten beds, the warm air is introduced between the two ranks of beds by means of five orifices in the central passage, while the vitiated air is drawn off through other orifices behind the beds. Thus, says M. Wœystin, a number of currents are formed from the inlets to the exit passages, which do not sufficiently draw away the intermediate layers of air, and thus cause many regions or currents of air not sufficiently ventilated, which become veritable reservoirs of infection; and this he believes to be the true reason of the increasing demand for a larger amount of fresh air. The introduction of a greater quantity of fresh air, according to M. Wœystin, only increases the rapidity of the currents, and has little effect upon the strata of air which lie above and round them, between the inlets and the ports of evacuation; the object therefore should be not to introduce masses of air, but to make better use of that which is admitted. To remedy this, M. Wœystin suggests the application of a well-known system—that of wire-work, or gauze; he recommends that the orifices for the introduction of fresh air should be covered by such a screen, reaching from the floor to the ceiling, and that the exit holes should be protected in like manner, so that the movement of the air should be graduated and dispersed over the entire contents of the ward. The importance of this question cannot be over-rated; all the world knows what relief has been obtained of late years in the case of fevers by a free use of fresh air, and the subject has been tested in a very remarkable manner in France, both in towns and in camps; patients have been placed under tents where the supply of fresh air was constant, and the temperature low, with an amount of success that gives immense importance to such experiments. It must not be forgotten, however, that draughts do not supply wholesome ventilation; and the shutting off, or rather the attenuation of them, must conduce to the comfort and well-being of the sick.—*G. W. Yapp.*

An Account showing the quantity of Sugar annually consumed in the United Kingdom, with the average rate and aggregate amount of duty collected thereon; also the average price, inclusive and exclusive of the duty, and the average quantity consumed by each individual, from 1815 to 1869 inclusive.

Date.	Quantity of Sugar consumed in the U. Kingdom.	Net Revenue.	Average rate of duty per cwt. paid.	Average price per cwt. in bond.	Av. price per cwt. inclusive of duty.	Population of the United Kingdom.	Average quantity consum'd by each.
	Cwts.	£	£ s. d.	£ s. d.	£ s. d.		lbs.
1815	2,523,326	3,654,412	1 10 4	3 1 10	4 12 2	19,118,000	15
1816	2,805,396	3,612,715	1 9 2	2 8 7	3 17 9	19,463,000	16
1817	3,680,692	4,434,051	1 7 1	2 9 8	3 16 9	19,772,000	21
1818	2,122,760	2,751,169	1 10 1	2 10 0	4 0 1	20,076,000	12
1819	3,111,018	3,996,589	1 8 8	2 1 4	3 10 0	20,398,000	17
1820	3,275,959	3,925,481	1 7 3	1 16 2	3 3 5	20,705,000	18
1821	3,412,245	4,188,997	1 7 4	1 13 2	2 0 6	20,985,000	18
1822	3,182,929	4,060,544	1 7 5	1 11 0	2 18 5	21,320,000	17
1823	3,466,209	4,407,476	1 7 4	1 12 11	3 0 3	21,672,000	18
1824	3,591,157	4,641,997	1 7 5	1 11 6	2 18 11	21,991,000	18
1825	3,271,388	4,176,673	1 7 4	1 18 6	3 5 10	22,304,000	16
1826	3,788,507	4,951,071	1 7 5	1 10 7	2 18 0	22,605,000	19
1827	3,539,865	4,650,224	1 7 2	1 15 9	3 2 11	22,893,000	17
1828	3,479,257	5,002,338	1 7 3	1 11 8	2 18 11	23,200,000	19
1829	3,809,710	4,896,271	1 7 4	1 8 7	2 15 11	23,535,000	18
1830	4,057,229	4,767,374	1 5 10	1 4 11	2 10 9	23,834,000	19
1831	4,076,253	4,650,606	1 4 2	1 3 8	2 7 10	24,083,000	18
1832	3,879,810	4,394,352	1 4 2	1 7 8	2 11 10	24,343,000	18
1833	3,766,411	4,414,346	1 4 2	1 9 8	2 13 10	24,561,000	17
1834	3,928,561	4,559,418	1 4 3	1 9 5	2 13 8	24,820,000	18
1835	4,022,850	4,667,920	1 4 2	1 13 5	2 17 7	25,104,000	18
1836	3,593,144	4,174,209	1 4 1	2 0 10	3 4 11	25,390,000	16
1837	4,048,665	4,760,576	1 4 0	1 14 7	2 18 7	25,676,000	18
1838	4,021,246	4,656,912	1 4 0	1 13 8	2 17 8	25,895,000	17
1839	3,830,393	4,586,936	1 4 0	1 19 2	3 3 2	26,201,000	16
1840	3,594,412	4,449,070	1 5 2	2 9 1	3 14 3	26,519,000	15
1841	4,057,900	5,114,390	1 5 2	1 19 8	3 4 10	26,730,000	17
1842	3,868,474	4,871,812	1 5 2	1 16 11	3 2 1	27,006,000	16
1843	4,028,326	5,076,326	1 5 2	1 13 9	2 18 11	27,283,000	17
1844	4,129,449	5,203,270	1 5 2	1 13 8	2 18 10	27,577,000	17
1845	4,856,680	3,574,471	0 14 9	1 12 8	2 7 5	27,875,000	20
1846	5,238,656	3,896,780	0 14 11	1 13 2	2 8 1	28,189,000	21
1847	5,805,638	4,405,237	0 15 2	1 7 8	2 2 10	28,093,000	23
1848	6,188,487	4,557,337	0 14 9	1 3 5	1 18 2	27,855,000	25
1849	5,980,824	3,912,170	0 13 1	1 5 2	1 18 3	27,632,000	24
1850	6,207,827	3,884,441	0 12 6	1 5 2	1 17 8	27,423,000	25
1851	6,571,626	3,979,141	0 12 1	1 5 2	1 17 3	27,529,000	27
1852	7,132,858	3,893,656	0 10 10	1 2 10	1 13 8	27,570,000	29
1853	7,487,589	4,083,836	0 10 11	1 5 0	1 15 11	27,663,000	30
1854	8,332,407	4,741,757	0 11 5	1 1 5	1 12 10	27,788,000	34
1855	7,547,157	5,058,500	0 13 5	1 6 9	2 0 2	27,899,000	30
1856	7,071,515	5,129,646	0 14 6	1 9 7	2 4 1	28,154,000	28
1857	7,419,514	5,055,034	0 13 7	1 16 9	2 10 4	28,188,000	29
1858	8,746,496	5,848,170	0 13 4	1 6 8	2 0 0	28,389,000	34
1859	8,884,299	5,935,909	0 13 3	1 6 8	1 19 11	28,590,000	34
1860	8,771,996	5,833,484	0 13 3	1 8 4	2 1 7	28,778,000	34
1861	9,180,980	6,104,325	0 13 3	1 5 0	1 18 3	28,974,000	35
1862	9,379,818	6,215,346	0 13 3	1 2 6	1 15 9	29,204,983	36
1863	9,452,794	6,249,815	0 13 3	1 1 10	1 15 1	29,395,051	36
1864	9,736,657	5,157,083	0 10 7	1 7 6	1 18 1	29,566,316	37
1865	10,603,926	5,193,816	0 9 10	1 2 9	1 12 7	29,768,089	40
1866	11,065,239	5,390,962	0 9 9	1 0 11	1 10 8	29,946,058	41
1867	11,692,519	5,584,659	0 9 7	1 2 6	1 12 1	30,157,473	43
1868	11,479,706	5,425,181	0 9 6	1 3 2	1 12 8	30,380,787	42
1869	11,739,094	5,388,652	0 9 2	1 5 4	1 14 6	30,611,305	43

LONDON DINNERS.

PART IV.

It is pleasant to find that our unvarnished tale of experiences of London dinners is not unacceptable, and to learn, as a chance perusal of the *Queen* informed us, that our praise or blame is accounted honest. The policy of the "Food Journal" forbids it to admit any other criticism. "*Quis custodiet ipsos custodes*," would indeed be the outcry, if aught save merit or demerit, so far as our poor judgment can discern, influenced our statements. So saying, we pass through Temple Bar, bent on dropping in "promiscuous like" into the City dining-rooms, and recording what we find or miss therein. We must own that, on making an excursion to note their whereabouts, we were much minded to abscond; so numerous, so various, and, at the old fashioned dinner hours, so full were they, that to examine them all seemed hopeless; to criticise any, useless. However, we will take a few of the leading ones, and more anon.

The enquirer into London dinners having passed through that ugly obstruction to traffic, Temple Bar, will turn into the well known "London." The unremitting care of Mr. Sawyer still secures a good repute for this house, though several internal alterations, and a rise of prices, have occurred since its well remembered first days. At that time he used carefully to caution inexperienced diners who ordered Manzanilla, then newly introduced by him, lest, as befel some, they should drink without understanding its flavour, and revile that excellent wine. Ascending the stairs, the visitor finds on the first-floor the coffee-room, where he can dine from the joint for 2*s*. On the next story is the room appropriated to "The London Dinner," at 3*s*. We tested both. All the rooms are spacious and airy, and one does not regret the ascent, in consideration of the cool atmosphere and freedom from culinary steams.

The bill of fare of the "London" dinner offered us:—Mock turtle and consommé au chou, mackerel and soles, emincé de bœuf, lamb's fry aux fines herbes, boiled leg of mutton, ribs of beef, vermicelli pudding, and cheese cakes. The soup was very good; the soles apparently belonged to a small species—all tail; the entrées were scant and ordinary; the joints of excellent quality, the cheese commendable, the cheese-cakes small and uneatable. The season, hitherto rainless, is certainly unpropitious for vegetables, and our parched gardens do but starve the thirsty crops. Still, in June, a dozen very small new potatoes, and some cabbage, do not represent vegetables for two; and we thought this dinner scarcely

up to the mark. The Manzanilla is not fallen off; the service too is nice, including finger-glasses, and rose-water in a lordly dish. The wine list presents a good choice, and the "London" cellar is well selected and fairly priced. The guest can range from cheap dinner wines to more expensive vintages, and have no reason to grumble. Attendance is charged, and is well performed. We were better pleased with the simpler coffee-room dinner. Let the visitor carefully enquire what fish and soups are ready in the room; he will save money and time, if either or both are objects. Very fair turbot, with sauce Hollandaise, and excellent veal, well cooked and hot, cheese, etc., were supplied us for 2*s.* 6*d.* The soups were marked at the usual absurdly high prices, and mackerel at 1*s.* 6*d.* made us question the evidence of our ears, which had heard costermongers crying their fish "eight for 1*s.*" Again, the vegetables were a weak point—a dish containing about two tablespoonfuls of second-rate peas being charged 6*d.* We could not forget that on our way we had just visited Covent Garden, and found the best peas 1*s.* 6*d.* per quart, and finest new potatoes 3*d.* per lb.!!

At the north-east corner of St. Paul's Churchyard, stands an old-established hotel, called the "Cathedral." The passenger, as he turns into Cheapside, espies a window garnished with those raw meats and vegetables, which are considered, we know not why, attractive tokens of dining-rooms. An *affiche* announces a *table d'hôte* at 5 p.m., price 1*s.* 6*d.*, which is a low figure, such institutions being rare in these days of high tariffs. As we knew the establishment to be of old standing,—over twenty years,—and of good repute, we determined to dine; we therefore entered, and found our way, by an intricate passage, to a long, narrow room. Plates were laid for about forty. The table was gloomily decorated with artificial flowers, in China vases. Imagine this in June. A shilling would have purchased a wealth of sweet, fresh, though common flowers, which would have given a grace to a ruder table and plainer fare. This single fact is highly characteristic of the inherent defect already animadverted on, viz., the stolid, Philistine indifference to what is nice in the outward adjuncts of London dinners. The table was not full, owing to the adverse influence of the Whitsuntide holidays. The dinner was very fair, nothing much to praise; and as regarded soup, fish, and meats, nothing to blame; two sorts of soup and fish, mince and ragoût of veal, boiled beef, and roast mutton, afforded materials for a substantial meal; but the vegetables—cabbage and potatoes—again proved a failure; and the meal was concluded by most execrable cheese, into the composition of which soap and beeswax had apparently entered in equal proportions.

The service and attendance were mediocre; and the order of serving, which commenced with placing the fish sauce on the table before the soup, was eccentric. The fact that such a repast can be supplied for 1*s.* 6*d.* each, though not so remarkable as the Oxford 2*s.* dinner, suggests that we might expect lower prices than rule elsewhere; and its success, inferred from its continuance for so long a period, argues that the *table d'hôte* principle only requires cultivation.

Another *table d'hôte* next demands our notice. At one and at four o'clock Simpson's board is spread in Cheapside, and the fame of it goes through many lands. Fellows from school, young men from the country, and exiles returning from India and China, have heard of it, or of the original fish dinner at Billingsgate, as "a place you must go to, you know;" and many a one can remember the fatal effects of the cold punch. Simpson's is crowded at one o'clock; it is often impossible to find a place; and, having found it, it is as often a struggle to obtain attention to one's wants. As to the Billingsgate dinner, we contented ourselves with the experience of a friend just home from China, who hurried thither full of expectation, and came away thoroughly disgusted with the scramble and the crowd. We betook ourselves to Simpson's, Cheapside, on the Oaks day. Two tables, like a disjointed T, were spread with coarse and scanty table-cloths; a knife, fork, and tumbler, marked each place; plain kitchen chairs were set so close as to touch each other. The well remembered head waiter, portlier than of old, superintended the preparations. A large boiled turbot and salmon appeared; while small dishes with dingy covers, each containing three old and dusky potatoes, alternated with boats of sauce, down the length of the board. Next succeeded fried soles and fried brill, softer than a plaice. The waiters dashed down the plates before each guest, scarcely waiting to ascertain if they contained the fish of his choice; boiled beef, roast mutton, steak-pudding, and the eternal cabbage, succeeded the fish; and cheese followed. There was certainly no attempt at cookery; plainest of the plain must be the officiating minister of that *cuisine*, and simplest of the simple, though hardly *simplex munditiis*, is the table service. This ichthyophagous feed must seem barbarous to strangers, and we wonder much in what consists the attraction. It is certainly cheap at 1*s.* 6*d.*, and the curious but deeply rooted habit of considering fish as a luxury alone explains why so many suffer the discomfort and want of all the decencies of the table, and the hurried inattention of the overtasked, but by no means over-dressed waiters, in order to eat two or three sorts of fish, whose gastronomic merits are not enhanced either by cookery, sauce, or relative order of

service. If one desires to *fast* on fish, Simpson's in the Strand will furnish as good a variety of fish, incomparably better cooked and served, for 2*s*. The bad arrangement of the crowded seats gave rise to an altercation, one guest seated at the inner angle of the table complaining that his neighbour's elbow "had been in his back all dinner time," to which the offender retorted that "he had been there fifteen years." The argument was unanswerable, and we suppose that any suggestion of improvement would be met by a similar reply; and so we do no more than describe our impression of Simpson's halieutica.

Let us now go on to Bishopsgate Street, where an exquisite oriel window of the 15th century looks down with contempt on the mercantile architecture of our own time. We wonder how many of the guests, who throng Crosby Hall, give a thought to the associations of the old City Palace. The dinner hour of the city clerk of the present gives him indeed small time to muse on the past banquets of the founder, Sir John Crosbye, knight banneret, who won his spurs, not on the hustings, but in the stricken field, and built Crosbye Place in 1466; or of the rich Spencer, Lord Mayor, who here feasted the great Queen, and those founders of England's greatness by sea and land, whom her wisdom delighted to gather round her. It is hard not to linger on the stirring memories called up by this place; here that much misrepresented politician, Richard III., dwelt; here again Sir Thomas More created Utopia, and ruled that household which Erasmus ranked higher than the academy of Plato; here Shakspeare, whose Tudor proclivities led him to "crooken" the figure and blacken the character of the defeated Richard, was a guest; and Jonson, in these precincts, learned to admire "Sidney's sister, Pembroke's mother." Through strange vicissitudes has the old building passed; now a palace, now a prison for cavaliers, again a preaching house, where Reynolds and Charnock expounded their hard creed; at another period the cradle of the infant East India Company. But it escaped the fire of London, and, more dangerous still, the vandalism of successive occupiers; till, after serving as a literary institute, and then a wine merchant's store, it became what it now is, an unique public dining establishment. A large sum of money must have been expended with correct taste in the judicious restoration and reinstatement, and a visit of inspection alone would amply repay the archæologist.

"The casements high and triple arched,
Garlanded with carven imageries"

have been filled with "thousand heraldries," and every possessor of "a splendid shilling" may dine in pleasant and spacious rooms,

and fancy he sits where city magnates and ambassadors, where Raleigh, Spencer,and a host of England's worthies have sat before.

Entering from Bishopsgate Street, we find in the council chamber where Richard received the offer of the crown, a spacious and well furnished luncheon counter; while, at a separate bar, tea and coffee are supplied at 3*d.* per cup. Dinners *à la carte* are served in the magnificent banqueting hall from 12 to 7 p.m. No unsightly and uncomfortable boxes deform the symmetry of the apartment, which is furnished with home-like tables and chairs. The *carte* offers an extensive choice. We found the quality of the provisions decidedly good, and the cookery above the average. The prices, whether for roast or boiled, at 7*d.* per plate, or for entrées, etc., are so low as almost to forbid complaint, if the average quality and quantity were inferior to what is actually the case. A pleasant peculiarity is, that the attendance is deftly rendered by waitresses, thirty of whom, in a neat, uniform attire, their ribbons suggesting a perpetual 'Varsity boat race, do their duty with alacrity, and not without "a temperate cheerfulness," as Erasmus says of More's household. We would, however, suggest that the alacrity with which the solids are supplied might be extended to the service of the fluids also. Each guest receives a billet, and, on going out, pays his reckoning to a *dame du comptoir*, 1*d.* being charged for attendance. A gallery is sacred to the use of lady visitors. In the beautiful and tastefully furnished throne room, dinners from the joint are nicely served at 1*s.* 9*d.*, including accessories, and a choice from five sorts of English and Swiss cheese—an example commended to other proprietors. We should fancy that this room affords the pleasantest dining-place for ladies in the city. Its advantages include a separate entrance from St. Helen's, and admirably appointed retiring rooms. We may mention that the absence of all unpleasant reminders of the culinary preparation is secured by the devotion of the upper story to the kitchens. The wine carte deserves honourable mention, both as regards prices and qualities of the wines. Especially to be noted is the recently introduced light claret on draught at 6*d.* per pint, while the vin ordinaire at 1*s.* 3*d.* and 8*d.*, and the St. Julien at 2*s.* 3*d.* and 1*s.* 6*d.* are decidedly good. We certainly are not afraid to recommend Crosby Hall either to the curious or the hungry visitor; and it did not at all surprise us to learn that public dinners, in yearly increasing numbers, are held in the banqueting hall and throne rooms, accommodating respectively 180 and 90 guests; though no Stowe chronicles the feasts, at which we may be sure the civic guests test to the uttermost the powers both of the *cuisine* and cellar.

W.

BREAD ADULTERATION IN GLOUCESTERSHIRE.

A GREAT number of cases of adulteration in Gloucestershire having been brought forward for adjudication by the police of that county during the past year, and more particularly in connection with the article of bread, I have thought that it would be a matter of interest to the readers of the "Food Journal" to detail the mode of action adopted, both for the detection of the adulteration, and for setting the law in motion against the offenders.

Foremost amongst adulterating material in bread and flour, stands alum. This has always been more or less a "vexed question" amongst chemists, arising partly from the difficulty, trouble, and labour involved in the old-fashioned system of analysis by incineration, and partly from the shortness of time allowed (forty-eight hours) in which to lay information, and take the necessary steps for prosecution. This sufficiently explains why so few cases of adulteration are brought under notice, notwithstanding their constant occurrence; and, but for my being placed in direct communication with the police establishment over the entire county, such a number of prosecutions (about 120 during the last two years) could never have been accomplished. The plan adopted was this. By order of the chief constable, I furnished every superintendent with a box of special tests and printed directions for use. The various bakers' and millers' establishments were visited, and samples taken for examination; when, if any showed suspicious signs (easily known by the blue colour produced), they were forwarded to me, information being laid within the forty-eight hours in compliance with the Act of 6 and 7 William IV. Subsequently, summonses were taken out, and I appeared to support them by ocular experiments before the magistrates, a conviction being obtained in every case, to the great astonishment of the accused, who had never contemplated such a result.

The cases were rendered so palpably clear, even to the probable quantity per sack of flour, that most of the parties admitted their guilt; but, as if to show how lightly the payment of these fines was regarded, ranging as they do from £5 up to £10 and costs, I may observe that, on my second survey of the county, some seven or eight bakers were again convicted in the full amount. Seeing that to be the case, it has been determined to make a periodical visit, in the hope of stamping out such a nefarious system; to say nothing of short weights and measures, which are manifestly notorious.

JOHN HORSLEY, F.C.S.

HOW TO EAT AND DIGEST.

On this all-important subject many theories have been propounded, whole volumes written; and yet as often has the very point been missed which ought never to have been forgotten, viz., that we must listen to the voice of nature. In our present enlightened age of science, and spelling made easy, most of us know that one of the first receiving houses for food is a double-mouthed bag, lightly slung in the space below the end of the breast bone, and called a stomach; that this bag is rather a complex structure, furnished with blood vessels and glands, which keep it in working order, and with a set of nerves, which telegraph to the brain when the working is out of order. The middle and outer coats of this bag have some muscles handily interwoven, and these are more plentiful and stronger at the lower mouth of the bag, and act the part of doorkeeper, to prevent refractory morsels of food from bolting through the opening, as raw recruits for the bowels. Then, for the blood vessels,—the very term implies the function;—and the glands, what are they for? To secrete juices which shall help to digest the food; while the nerves are the telegraphic system which permeates the whole structure, and signals very distinctly to the brain when blood vessel, gland, or muscle, is failing to do its respective duty, or doing this duty inefficiently. If, then, we can bear in mind two great facts connected with the stomach, namely,—that it has, first, a set of blood vessels, and therefore can be inflamed; and, secondly, that it has nerves, and therefore can be pained,—we may perhaps feel more disposed to be cautious in our treatment of the same. Luckily for us, it is a good stout bag, and will stand plenty of wear and tear; but the proverbial camel has its back broken by the last load, and the stoutest leather will occasionally give way, instead of stretching to circumstances; so, is it to be wondered at that the stomach sometimes strikes work?

My reader may ask, "How am I to tell whether this or that food agrees or disagrees with me?" I answer, "By your sensations." The nerves will telegraph the state of affairs. At first uneasiness, and then pain, will tell you whether the food you have taken has agreed, or the reverse. And, indeed, it *is* a question of agreement; you must come to terms with your stomach; for if you

do not, it will eject the unwelcome lodger, or pinch and gripe you into submission. So that by listening in time to the warning given by pain and uneasiness, you may avoid the life-long trouble of indigestion, that neither Cockle's pills nor Du Barry's "delicious food" will suffice to remove; whatever the one or the other may have effected for the general public, or for his holiness the Pope.*

I have spoken of the stomach individually as a separate organ, because it is perhaps more generally understood, if not more generally talked of; but we must not forget the part played by the bowels in the great drama of digestion. "Your stomach is out of order" is about the first sentence uttered by the medical man to his patient who shows him a furred tongue. Sir James Eyre has discoursed pleasantly and well on "The stomach and its difficulties." "I have a weak stomach" is the complaint of the dyspeptic. It is, as I said before, a good, stout organ, and will bear much rough work; and it is well for us that Nature has so constructed it, for when so many bolt their food with little or no mastication, how necessary is it to have another set of teeth lower down, to reduce the precipitate morsels to that more harmless compound known as chyme. This is what the stomach does for us,—it remasticates our food,—only the teeth are replaced by certain juices, the constituents of which are a Babylonian mystery to physiologists. The stomach thus does the first hard work that has been shirked or slurred over by the teeth; and, though supplied so richly with blood vessels, is rarely attacked by inflammation; showing that, after all, we must look to the poor neglected bowels for most of our digestive troubles. The remarkable example of the keeper of the Eddystone lighthouse only proves this fact too plainly; for when that building was destroyed by fire in 1755, one of the men, on looking up at the burning mass, evidently with his mouth wide open (from astonishment no doubt), swallowed 7 oz. of the molten lead that fell from the top, and lived for ten days afterwards.

After such a case as this, what will not the stomach valiantly undertake? What has it not undertaken? Witness the fine collection of clasp knives in the Royal College of Surgeons' Museum in Lincoln's Inn Fields, swallowed by an adventurous tar, endowed with more courage than sense. This human ostrich was in the habit of swallowing knives and tenpenny nails, partly from bravado, and partly from love of gain, for his messmates paid him for making these gastric experiments. However, one unfortunate afternoon he dined too freely on Sheffield cutlery, and paid the penalty

* Vide Testimonial 33,300,001.

of death for this unusual debauch. These are instances of the great endurance of the human stomach, but they are by no means examples for us to turn fire-eaters or Indian jugglers, but rather to warn us against making any rash trials of the powers of the stomach; for there is one little peculiarity about this organ,—that, after repeated attempts to stay the progress of a tough morsel, the valve which stops unlawful exports becomes weary, and passes the contraband wares through sheer fatigue. The consequence is, that the fragments which withstood the peptic machinery of the stomach not only defy, but wound the more delicate surface of the bowels. Pause then a moment before raising a tough, though tempting morsel to the mouth, and think of the journey it will undertake, when it has once fairly shot the rapids of the gullet, and got into the seething current of food that whirls and eddies in the great stomach lake below; and, as lighter craft glide safely over the Canadian rapids, so let your food morsel be light, and the transit will lose all danger.

Given, therefore, a stomach, strong yet sensitive, having a still voice like conscience, and bowels delicate and impressionable—is it not fair that Nature makes us suffer through these organs, when we insult her so grossly by irritating them with bad food, ill-cooked, half masticated, and wholly unfit for the purposes of nutrition? We deserve to suffer, and richly too. Sometimes we pour chemical compounds into the beautiful laboratory of Nature, and call them stimulants, but our chemistry is ill-applied. Stimulants they are in one sense, for they excite the coats of the stomach and bowels into a state of chronic inflammation. But this is not the whole sum of our folly. Barely satisfied with the mischief already worked by bad food and villainous drink, we crown all by vexing the unoffending liver, "more sinned against than sinning," with blue pill, and the already wounded bowels with black draught. My gall rises as I write. Is it wonderful that we suffer? Is it surprising that we fall sick? How about that pain behind the shoulders, as if somebody had knocked you down with a paving stone; and that pain in the stomach, as if the same assailant had, in Irish fashion, trampled on you when you were down? Did not that tough, leathery fragment, served as a steak, and chewed like rhinoceros hide, play some part in originating these pains? and did not the waiter, putting a decanter before you with an inky fluid in it, call it wine? Port wine I think he called it, and misquoted the year of its birth by a quarter of a century. And did you not pour this liquid fire over the inflammatory steak below, swallowed but not digested? And then, did you not, rushing

wildly away to your office, bury yourself in your books? and was it a wonder that the devil of indigestion, the demon of dyspepsia, piped to his own?

This picture is by no means overdrawn. Hundreds of city merchants lead this spasmodic life for a few years, and then wonder that their stomachs are out of order. The wonder is, that their stomachs have kept *in* order so long. To those who say, "You have shown us how to get indigestion, but we want to cure it," I answer, "Do not talk about curing it, but rather ask how you shall prevent the same." This will be the safer and the more satisfactory plan; for though it is a very good thing to go to a doctor (for the doctor), it is a much better thing to keep away from him (for the patient); and if you can learn this happy art, enjoying good health at the same time, you have discovered the true elixir of life.

To begin with, take your meals regularly: do not dine at 2 p.m. to-day, and 7 p.m. to-morrow, and 4 p.m. the day after; but fix some stated hour; and, for the workers, I should say that from six to half-past six is a good and serviceable hour. Dining late is, as a rule, preferable to mid-day dinners, for dinner ought to be the principal meal of the day, and, to be enjoyed as well as digested, admits of neither hurry nor interference. The work of the day should be over; and a long rest, followed by light occupation before bedtime, will be singularly conducive to health as well as happiness. What profit or pleasure can you get out of a dinner when you know that an army of clerks awaits your supervision, or that some very tall and remarkably stout ledgers have to be balanced as soon as the cloth is removed? You wait with impatience for the courses to be served, for the food to be swallowed; but as for the digestion of the same, that is quite beyond your jurisdiction; your business is to clear so many dishes in a given time; your work is cut out before you, and, like a true Briton, you are not the man to shirk it. But you must consider that you have a stomach to superintend as well as clerks, and that if you do not give the bowels a passing thought, the balance will be dead against you in the ledger of health. Do not forget the good old adage, "After dinner rest awhile." Let your meals be considered as important an item in the business of the day as watching the firmness of foreign markets, the looseness of grey shirtings, or the fluctuating fortunes of the Mexican republic. If you are to ignore the art of dining, you may as well repudiate at once the art of living and working, for rest assured that, unless you dine with judgment, you will not be able to calculate with foresight; and, just for the lack of a little

gastronomical knowledge, you may be a bankrupt. Is there not the old story quoted by everybody who has written on food and digestion, namely, that the first Napoleon lost the battle of Leipsic from eating a badly-cooked mutton chop? He died of cancer of the stomach. I do not say that this was brought on by his hastily-snatched, half-masticated cutlets and chickens; but if we allow that a man has a predisposition to malignant disease, is it unlikely that the most ill-treated organ should be attacked by the disease? Be careful as to the character of your food—your imports let us call them; let them be nourishing, digestible, and judiciously cooked; for if these three qualities are combined, you willi nclude a fourth, namely, that they shall be palatable. It is easy enough to tell you what is nourishing; those household words, beef and mutton, imply a multitude of dishes that shall nobly support life, and rarely fail to please the palate. Possibly you may reply, "That's nothing new; anybody could have told us to eat beef and mutton; we have been eating it all our lives." True, you have done so, but as unconscious of its merits as *le bourgeois gentilhomme* was of his conversation being prose—"*Vive la Prose! il y a quarante ans que je parle la Prose.*" It may be that you have been eating beef for forty years, and yet you may be even now profoundly ignorant of its full merits and capabilities. You have not always eaten it with judgment; you have eaten it tough, perhaps, or with the juices of the meat extracted, or with greasy accessories that do not harmonise with either the meat itself or the consumer thereof. Perhaps you have, with unflinching fidelity, stuck to the same joints, scorning any change to interest the stomach or stimulate the appetite; so that familiarity with these household words has bred contempt. Study variety, or let your cook do so, if she has brains (I do not write for those who keep a male *chef de cuisine*); if your cook lacks intelligence, let your wife come to the rescue; for, in common courtesy, we will admit that *she*, at any rate, is gifted with these organs of thought. There is a general idea prevalent that all beef is pretty much of a muchness, more often tough than tender, instilling us with the belief that a bullock is an animal possessed of ribs which admit of mysterious rolling, and of a part which is liberal enough to supply us with steaks for the usual accessories of onions or oysters. But remember, *il y a des pommes et des pommes*, there are bullocks and bullocks, beef and beef, of varying qualities.

E. B. Shuldham, M.D.

ICE.

The use of ice has gradually increased among our population in the last twenty years, at an ever accelerating rate, although it is as yet by no means as necessary an article in our domestic economy as among our American cousins. Boston is said to consume double the quantity of ice that contents London, yet, wherever we go, "Iced" heads the advertisement of drinks in our places of refreshment; and refrigerators and various contrivances for the application of ice are advertised extensively. In such an unprecedentedly hot season as the present, the British public slowly but surely wakes up to the necessity of utilising the wintry cold products to balance the summer heat. Ice not long ago was accounted a luxury; it is not yet, but we hope soon will be, esteemed in the household, as well as in places of public entertainment, a necessity; economy advises it, health and taste demand it, but so long as we depended on the uncertain home supply, expense forbade it. The hardest English winter, moreover, though it might fill private ice-houses and the ice-wells of our dealers, would not yield ice of a reliable purity, or of a durable degree of congelation. The importation of Wenham Lake Ice from America was the first step in the process of bringing within reach of every one Ice of a strength, if we may use the term, which would bear transit and keeping, and a purity which would allow a lump to be dropped in to cool, as sugar to sweeten, any beverage. Various attempts have been made to manufacture ice on a large scale; the use of a ten-horse power engine has enabled 5,000 to 6,000 tons to be produced by one process in a day; but the London market—and, by the northern ports,—the various English markets are now altogether supplied with ice from Norway. The amount is influenced by the severity or mildness of our winter, and varies from 30,000 to 50,000 tons; the ice from the rivers and ponds in the environs of London is by no means neglected, for it is gathered and stored—and, as rough ice, is preferred for all exterior purposes. The various trades; fishmongers, brewers, confectioners, butchers, and poulterers, prefer the English ice, if procurable, not only as cheaper, but because it yields more readily to the liquefying powers of the salt mixed with it (usually 3 lbs. of salt to 10 lbs. of ice), and thus cools or freezes more rapidly than the hard smooth

blocks of foreign ice; it has, as a leading ice merchant remarked, "more gravy in it." Thus the patriotic mind need not fear that the Norwegian ice, like the carpentry and firewood, will supersede our home production. It must be borne in mind that ice which is mixed with our food or drink must be pure, and all ice that looks clear is not necessarily pure; for our analysts tell us that, as clear sparkling water may hold in solution poisonous matter, so crystalline ice may when dissolved actually prove putrescent, and by smell betray the foulness of the water whence it came; or else it may contain unsuspected unwholesome mineral salts. The mountain tarns and lakes of Norway, fed by the melted snows, and uncontaminated by drainage, yield a pure wholesome ice; and the Norwegian bonders have found a new source of industry and profit in the ice harvest. The Oppegaard Lake, now rechristened the "Wenham Lake," and the property of the company of that name, is but one of many which rival, though do not surpass it, in the undoubted purity of its waters. The process of ice-ploughing and storing need not be described. The ports of Drobak, Drammen and Christiania, Lauwig and Kragero, Wiburg and Brockstadt, are the chief emporia, where the huge crystalline blocks, weighing from 2 to 4 cwt., are stored, waiting for the opening of the navigation, and the demands of heated London. By sailing ship and steamer, sometimes in advance of the demand, sometimes in answer to a hurried telegram, the supplies of solid coolness and refreshment come. The king of the ice trade is Mr. Stevenson, whose trade thirty years ago was but 300 tons annually, and now reaches 600 tons per week; next come Messrs. Leftwich and Carlo Gatti, who deserves the praise of having brought ice within reach of even the humblest. We have visited the ice stores of Messrs. Stevenson; the wells consist of enclosed brick chambers of 50 cubic feet, with double doors, in thick, double brick walls, excluding all light; and each chamber contains 1,000 tons. A steam lift hoists the cart loads of ice to the top, and it is thence shot down just as coals are loaded into a collier. The cold, dark atmosphere, with the steam rising from the icy floor, might suggest a dream of one of Dante's circles. Near the principal wells in Cambridge Street, Hackney Road, are others of an older construction, built underground, and of less capacity. Above the roof of the wells is a loft with open sides, for storing and drying sawdust, of which 200*l.* to 300*l.* worth is used annually in the packing of the ice sent out. The huge blocks come over in the vessel's hold without any packing, and are handled like blocks of marble. But many a one who has vexed his soul with trying to break a lump of ice, will be surprised

to learn that to split them into manageable pieces, it is only required to take a sharp pointed "ice-dibber" like a large brad-awl, and with this to stab the surface, making several slight holes in a line, when the block splits without any further trouble; to divide a small piece of the hardest ice, you need only take a bodkin and sharply prick it, and it will break up without flying into your face or your neighbours lap—wit herein surpassing strength.

The ice as imported can be sold at prices varying from 30*s*. to 40*s*. per ton; but, of course, the waste and fluctuations in demand, and the difference in the rate of supply to large and small consumers, do not allow it to reach the general public at that rate; but the supply can always meet the demand; and the hardy Norseman, by the beneficent intervention of Messrs. Stevenson, Leftwich, Gatti, Kent, the Wenham Lake Company, or Messrs. Duus and Brown, of Fenchurch Street, can furnish us all with this cheap luxury, whenever that happy time comes in which Londoners are as wise as the Americans in the use of ice. We have already enumerated the trades in which ice is used: for long the fishmongers and dairymen monopolised it as a preservative; now the butchers and poulterers employ it extensively; the brewers use rough ice to cool their wort, or even throw the Norwegian blocks into the vats; bacon too is cured by its help. The public more directly appreciates the luxury of ices and iced drinks; and, in the household, the benefit of refrigerators, ensuring cool water, solid instead of oleaginous butter, and joints kept long enough to be tender, without disappointing the mistress and destroying the equanimity of the master. We will not attempt to enlarge upon the different varieties of ice pudding, dessert ices, etc. Next to their richness and flavour, the great secret of their preparation lies in the care with which they are whipped or churned during congelation. Most machines for this purpose are constructed on the rotary principle. Kent's Paragon Freezer appears adapted to save labour, and the Imperial of the Wenham Company is also a good one for the purpose. Ash's Piston Freezer, as its name imports, is worked up and down, and an advantage is obtained of being able to ice wine, make block ice, and freeze dessert ices in one operation: in all these either ice and salt are used, or else freezing powders. A very simple one can be made by mixing 1 lb. nitrate of ammonia, 1 lb. carbonate of soda, and 1 pint of water; or a more intense freezing mixture, with 2 lbs. pounded ice and 3 lbs. crystallised chloride of calcium or salt of lime. It may not be amiss to remark that a quantity of ice after meals is injurious, by stopping the secretion of gastric juice, and interfering with the process of digestion. A gastronomic protest may also be

made against the somewhat senseless fashion of following up iced pudding with post-prandial dessert ices,—that is to say, if you wish to relish your wine. The palate is demoralised; far better to keep the ices for the drawing-room, for both the digestion of the diner and the enjoyment of the wine will be improved by the postponement. We will not venture on praise or dispraise of the various ices of the numerous confectioners; we only wonder at the badness of some, and rejoice to see the custom of mixed, or "Neapolitan" ices becoming general, the water ice, by the harmonious discord of quality and flavour, improving the cream. It is a cause of wonder why, in some confectioners' shops and in theatres, 1*s.* should be charged for ices neither so good nor so plentiful as Carlo Gatti, for instance, serves in that new and beautifully decorated café near the Hungerford Pier.

The mention of Mr. Gatti reminds us that the enjoyment of ices is now by no means a luxury confined to the possessor of 6*d.*, for he was the first introducer of penny ices. He himself assured us that in 1851 he sold no less than 3,000,000; and now, though they are not as popular, partly owing to the carelessness of the vendors, there are two hundred shops in London where 1*d.* ices are procurable; but besides these we have seen little gamins, such as thrust the *Echo*, *Sun*, and "box o' lights" in the faces of passengers, standing round a street *ice-stall*, each with his glass of bi-coloured ice, licking it up, spoons being despised, with great enjoyment, and paying ½*d.* for "the ice." An itinerant vendor, whose stall was in Seven Dials, informed us that on a fairly hot day his average earnings were 7*s.*; his ices, of one colour, were composed of eggs, milk, arrowroot and sugar, and he could sell 5*s.* worth for 12*s.* The ice necessary for freezing he bought for 2*s.* 2*d.* per cwt.,—English ice. Whit-Monday, with its blazing heat, was a great day for him, for he sold halfpenny ices at Hampstead Heath to the amount of 3*l.* 15*s.*! At all events they were innocuous, which is more than we can say for all cheap popular refreshments.

We hope it will not be deemed an impertinence to suggest to the reader that wine is very often spoiled by being iced instead of merely cooled. If the wine be bad, especially "sparkling," ice it well by all means, and drink it while effervescing, and you will not notice its quality so much, till afterwards. If good, let it be first cooled, not in ice, but water, with some ice in it, so as to avoid excess of cold; for the colder the wine the less its flavour, and you can, if you choose, sacrifice the flavour to the luxury of a cool drink. Champagne frappée is a specialité. The water is frozen, and the delighted but extravagant palate is rejoiced with the spirit and the

liqueur. It is to be remembered that it is needful to wrap a wet cloth round the bottle when removed from the cooler. As for iced cups and mixtures, their name is legion, as may be said of the many refrigerators of all sorts and sizes. Norway, not content with supplying ice, has recently sent over very cheap refrigerators, which certainly seem adapted for simple use, and are decidedly so for households of small incomes. The danger, so often incurred, of the various meats, fruits, etc. being contaminated by any ill-odour, or even by the closeness of the vessel, is admirably obviated by Kent's ventilating refrigerator. The same ingenious inventor has supplied our licensed victuallers with a bottle refrigerator, or ice wine bin; and has met the requirements of small families by a miniature contrivance which can stand on the sideboard, or even ensure a comforting coolness of drink for the sick patient. A very complete and elaborate affair is the "Duplex" of the Wenham Company, which can be used either for rough or block ice, and is furnished with a tank for iced water. We would not advise the possessors to use this water for their matutinal tub, however grateful the chill of the water may be. No one over twenty-five, or under, if wise, will subject himself to the injurious and depressing influence upon the system exercised by a really cold sponge bath. We can only briefly touch on the use of ice as a hygienic agent. Not only are iced drinks grateful to the fevered palate, but the sick craving for them may be safely gratified; and we must here mention a fact creditable to the charitable donor, that any sick person, at any hour of day or night, is supplied with ice gratis at Mr. Gatti's ice stores, on production of a medical certificate. Ice is the best remedy in *coup de soleil*, or any headache brought on by exposure to the sun, as its application produces constriction or contraction of the minute blood vessels, which are relaxed by the heat. For hemorrhage and irritability of the stomach, ice is largely used as a remedial agent. We do not know whether its application is a remedy for sea sickness, but we are sure that the increased employment of it in our hospitals would be of great advantage; and we heartily commend the example of Mr. Gatti's benevolence in ice to our other ice importers.

E. Wade.

We have recently had an opportunity of tasting a new import from Norway, in the shape of Norwegian bottled ale, which resembles the Bavarian beer, but is not so sweet. The Norwegian ale is light, clear, and pleasant; and, we should think, a sound and wholesome beverage, especially suited for summer.

PUBLIC HEALTH.

Part V.—VITAL STATISTICS (continued).

If, in a living population of 100,000, two thousand deaths take place every year, then $\frac{2000}{100000}$, that is, one-fiftieth, or two per cent., will be the

Rate of Mortality.—The term has been rendered familiar to us through the column devoted weekly by the *Times* to the Public Health, and the death-rate has come to be accepted as a fair test of sanitary conditions, as well as a true barometer of health. Shall we be right in so accepting it? In the first place, it must be borne in mind that the rate of mortality differs for every period of life. "It is in infancy very high, in boyhood very low, through manhood it increases, and, as men descend into the vale of years, is rapidly accelerated by the wearing away of vital force. The rate for males is 183 in a thousand in the first year of life; only 18 in the fifth; 6 in the tenth; 5 in the sixteenth; 13 in the forty-first year; 33 in the sixty-first; and 153 in the eighty-first year of life."* The number, sex, and ages of the living will affect the "rate of mortality," as we have already seen that they affect the calculations respecting "the expectation of life."

There is, therefore, at present no absolute numerical test of a people's health. The figures presented to us by the Registrar-General in his weekly, quarterly, and annual reports, must be regarded as approximations to the truth; most valuable as indications of sanitary conditions, and incentives to sanitary action, but not absolute indices of a town's position in the sanitary scale. To quote the words of the weekly report already mentioned:—"A comparison of the true rates (calculated by life tables) with the rates calculated in the usual way, will show that the latter exhibit the relative fatality of different cities with *sufficient accuracy for all ordinary purposes*. The causes of the differences of the rates of mortality are various, and in every case demand careful investigation on the spot by the town authorities." In other words, the true meaning of the death-rate can only be ascertained after reference to local conditions of climate and soil, to the ages, sex, occupations, and social

* Weekly Return of the Registrar-General for week ending Saturday, March 26, 1870.

status of the inhabitants; in short, to all those circumstances which modify the vitality of populations, and control at once the prevalence and fatality of disease—*non numerandæ sed perpendendæ sunt observationes (Morgagni)*—it is the abuse and not the proper use of statistics which has sometimes brought the numerical method into contempt, and has led those who scoff at exact science to remark that "you may prove anything by figures."* The unfair use which has sometimes been made of the rates of mortality, even in the highest quarters, has laid them peculiarly open to attack, and has given rise to some severe criticism on the present system of mortuary returns.† It is not in human nature that towns should quietly submit to be degraded in the sanitary scale, and gibbeted in the press on the imperfect evidence of a few short weeks; or that a flourishing watering place should accept, with becoming gratitude, the imputation of harbouring an epidemic long after all trace of disease has passed away. Deserted houses and an empty season are a punishment out of all proportion to the offence of a temporary rise in the rate of mortality, when it is well known that fluctuations in the death-rate within certain limits may occur without any assignable cause beyond the ill-understood influence of seasonal changes.

But if the death-rate is to be used ever so roughly as a test of health, it will be necessary at the outset to fix on a standard for comparison, and this has been done. In the year 1858, Dr. Headlam Greenhow presented to the General Board of Health the results of a minute inquiry into the sanitary state of the people of England—a report which was a worthy forerunner of the valuable series since issued by the Medical Department of the Privy Council. It was then found that the highest death-rate in England was Liverpool, with its 36 deaths per 1,000; whilst the lowest, 15 in the 1,000, was found at Glendale and Rothbury in Northumberland, and Eastbourne in Sussex. In no less than 64 districts it was less than 17 in the 1,000, whilst the general death-rate for England and Wales was 23 in the 1,000. These figures naturally became rough

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* Dr. Guy, in his admirable lectures on "Public Health," lately published, remarks of the numerical method that "Every honest man finds it a friend; to the man who prefers the triumph of an opinion or a party to the truth, to him alone is it an enemy."

† See articles in "Social Science Review," Vol. V., New Series; one by Mr. W. Sargant, "Statistical Journal," June, 1864; "Public Health—the right use of Records founded on Local Facts," read before the Social Science Association at Bradford, by Dr. H. W. Rumsey, 1860; Paper by Dr. Wm. Budd—Social Science Transactions, 1869, p. 492; and many others.

standards in sanitary statistics, and a sustained mortality above 17 in the 1,000 is now held to imply unfavourable sanitary conditions, and to warrant searching inquiry for the cause on the part of local authorities. The healthy standard for large town populations is more uncertain. The average rate for the 17 large towns of England, calculated on the first quarter of the present year, is 27; the highest being Manchester, 32·7, the lowest Sunderland, with 21·9 per 1,000.* But these are high figures, the result of a season specially destructive to life. London and Bristol, with a death-rate of 23 per 1,000, were the healthiest of 10 large towns in 1867, when the mortality in Manchester was 31·4. Perhaps 24 in the 1,000 may be regarded as a fair death-rate for towns of the first magnitude. But, beyond these absolute standards, each sub-district will have a standard of its own by which to gauge its relative health from year to year; and it is by a right use of these several data, that sanitarians have been enabled to obtain an insight into great questions of health, such as the direct connexion existing between overcrowding and a high death-rate, the influence of seasons and climate, not only on the general rate of mortality, but on the fatality of certain classes of disease; and, lastly, the influence of occupation, food, drink, and other health conditions on the length and strength of man's life. The general rate of mortality has in this way come to be considered as a rough test of Public Health. The male death-rate has been preferred by some authorities (Sargant), the mortality in early life by others. "I believe," says Dr. Gairdner,† "that in the end, the infantile mortality will be found the truest and best test of the sanitary state of a district;" and Mr. Simon: "It cannot be too distinctly recognised, that a high local mortality of children must almost necessarily denote a high local prevalence of those causes which determine a degeneration of race."‡ Mr. Sargant is of opinion that the death-rate of infants between one and five years of age will be found to indicate most fairly the health conditions under which they have lived.§

I shall now pass, without further delay, to consider the items of the death-rate, as illustrated by the causes of death.

Cause of Death.—When the Act for the Registration of Births, Deaths, and Marriages was passed through the House of Commons,

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* Quarterly Return of Registrar-General, May, 1870.

† Public Health in relation to Air and Water. Edinburgh, 1862.

‡ Report to General Board of Health, with Papers relating to the Sanitary State of the People of England, p. xxvii.

§ "Journal of the Statistical Society," June, 1864.

no mention was made of the *Cause of Death*. This happy and most important addition to the dry bones of the Act was inserted in the House of Lords, and was due to the zeal and watchful forethought of the then Registrar General, and of Dr. W. Farr.

It stands on a different footing from the registration of the fact of death, in that it is a *voluntary declaration* on the part of the medical attendant; and it is no small testimony (in spite of the sarcastic remarks of the Registrar General),* to the zeal of the profession for sanitary knowledge, that Dr. Farr can tell us, in one of his admirable letters on the causes of death, that during the year 1867, "In London about 93 per cent. of the deaths are certified, as far as the causes of death are concerned, by the medical attendants, five by the coroners,—leaving only two in the 100 uncertified."† And again, in the 31st Report just issued, that in 1868 "of 480,622 deaths in England the causes were assigned more or less distinctly in 473,773 cases; leaving 2,945 sudden deaths in which inquests were held without discovery of the cause; and 3,904, other cases of various kinds."

The returns for England, though far from perfect, as we shall see, are at present without a parallel in Europe; and, at the International Statistical Congress, it was allowed, on the part of Prussia and other States, that they had not medical men enough to attend the poor and certify the cause of death.‡

If the mere enumeration of deaths, as seen in the "rate of mortality," is sufficient to convict a people of sanitary neglect, we might naturally expect to find in the causes of those deaths a clue to the special nature of the delinquency. Diseases bred of dirt and of sewer emanations, such as typhoid and diarrhœa—diseases due to bad ventilation and crowding, as typhus—to neglected land drainage, as consumption and ague—to polluted water supply, such as cholera—are tracked to their foul haunts with the certainty of the sleuth hound; much light is thrown on the laws affecting the aecession

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* "Considering the privileges enjoyed by legally qualified medical practitioners, and seeing that in using the knife, and in administering poisons, they have free scope and no limit to their discretion; having every credit given them for the exercise of the highest skill, although death may not be arrested, and being seldom subjected to investigating inquiry as to the precise treatment of their patients, differing in this respect from quacks, herbalists, &c., I cannot see that there is any hardship in a medical man being required to state the disease which, in his opinion, killed the patient who died under his treatment."—31st Annual Report of Registrar General, Appendix C.

† 30th Annual Report of Registrar General.

‡ Evidence, Royal Sanitary Commission.

and recession of epidemic disease,* and the fitness of certain localities for health resorts may perhaps be indicated with sufficient accuracy for practical purposes; but a reference to Dr. Farr's remarks in the First Annual Report of the Registrar General, (appendix P, p. 86,) will show that we are still far from enjoying all the advantages which he was led to expect in 1839, when the causes of death were first returned; and the reason lies, I think, in the fact that centralisation has been the ruling principle of our Registration system; that provincial and purely sanitary interests are sacrificed to the more imposing, but scarcely more important requirements of commerce, of scientific medicine, or of the State.

The medical man is practically denied access to the register which he has helped to fill, and has a month at least† to wait for facts which might have been invaluable during the uphill battle with disease, but are scarcely so interesting in the lull which succeeds. The apathy of the medical profession in general, with respect to returns of death and causes of death, is intelligible on these grounds; but there may also be doubts in the minds of some as to the reliance which can be placed on the analysed returns of fatal disease.

E. T. Wilson, M.B.

[TO BE CONTINUED.]

A very useful domestic apparatus, the invention of Mr. Hancock, is to be seen at Messrs. Bradford's, in Fleet Street, for cutting up bones. By means of a long handle, a screw, and a cutting edge, an enormous power is brought to bear upon the bone, whatever its thickness may be; and the advantages obtained by the operator are, that the gelatine of the bone is so carefully preserved that its value for soup as stock is greatly enhanced. Not an atom of the bone, as a food producer, is lost, the bone dust which is formed during the cutting process being an admirable material for poultry feeding, or for manuring vines and other garden trees. The price is reasonable, about 30*s.*, and we can recommend the machine as undoubtedly promoting economy in large or small establishments.

A suggestive fact has been communicated to us by a brewer in the country, who was anxious to ascertain the cause of the constantly increasing value of malt sweepings, which were said to be largely used for feeding pigs. After experimenting upon his own, which daily became poorer under the trial, more minute enquiry was made, and then was discovered the real use of the sweepings, namely, to mix with chicory; which again, in its turn, would be sold as coffee. Can adulteration be carried to a lower depth?

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* See Dr. Ballard's papers read before the British Medical Association at Oxford, 1868, and his Analysis of cases of sickness during twelve years in Islington; 11th Report of Medical Officer of the Privy Council.

† The causes of death from certain diseases in subdistricts are now given quarterly by the Registrar General; but, with the utmost dispatch, the Return to the close of March cannot appear before the beginning of May.

DOMESTIC HYGIENE.

No. I.—THE KITCHEN RANGE.

AMONGST all the fittings of a domestic residence, it may fairly be asserted that none are so important to the comfort of the inmates, or at times more conducive to their discomfort, than the means and appliances employed for warming the building. What more delightful than the winter fireside of a country house? or more miserable than a smoky chimney? The whole subject of fireplaces, chimneys, and fuel, is indeed, so far as the householder is concerned, all one, though it requires to be considered under several heads; we shall also show, in due course, that economy and the healthiness of a household are intimately connected with the same question. As, however, it would be impossible to treat on the several heads enumerated above in one article, we propose first of all, after a few introductory remarks on chimneys, to devote our attention to the Kitchen Range, as being unquestionably the most important fireplace in any house.

It is, we believe, nowhere recorded when and where chimneys were first invented. They were evidently common in Venice before the middle of the fourteenth century, for an inscription over the gate of the school of Santa Maria della Carita states that in 1347 a great many chimneys were thrown down by an earthquake, a fact confirmed by John Villani, who refers the event to the evening of the 25th of January. Leland, also, in his account of Bolton Castle, which he says was "finiched or Kynge Richard the 2 dyed," notices the chimneys in the following words:—"One thynge I muche notyd in the hawle of Bolton, how chimeneys were conveyed by tunnells made on the syds of the walls betwyxt the lights in the hawle, and by this means, and by no covers, is the smoke of the harthe in the hawle wonder strangely conveyed." In the year 1368 also, Galeazo Gataro relates that Francisco da Carraro, lord of Padua, came to Rome, and finding no chimneys in the inn where he lodged, because at that time fire was kindled in a hole in the middle of the floor, he caused two chimneys, like those that had been long used in Padua, to be constructed by the workpeople he had brought with him. From the foregoing facts we may, perhaps, with some degree of correctness, fix the fourteenth century as the date of the first introduction of chimneys.

Now the use of chimneys being, primarily, to carry away the products of combustion; and, secondarily, for purposes of ventilation,

the subject must be considered in both those lights. With the huge wood fires of our ancestors, the large hearth recess and the capacious flue did not interfere with the accomplishment of the object proposed; but when fireplaces were introduced into small rooms, and coal was substituted for wood, the arrangements which were suited to the baronial hall or kitchen did not apply. Five hundred years of experience in chimney construction does not appear to have resulted in the deduction of scientific rules for their apportionment, so far as houses are concerned. In this respect Architects have unquestionably been left far behind by Engineers, who, when they desire to erect a chimney shaft for a factory or steam engine, carefully apportion the dimensions of the structure for the work which it has to perform; it is, however, too often the case that flues in houses are constructed of the same sectional area, whether they be twenty or fifty feet in height; whereas dimensions that may be suited for the one height are perfectly inappropriate for the other. One consequence of this is the disfigurement of buildings by the addition of chimney pots, for the purpose of contracting the orifice of a flue which has been constructed too large for the duty that it has to perform. Defects arising from this cause are too often attributed to the position of doors or windows; whereas the real reason of their existence is assignable solely to the entire absence of any calculation for determining their proper proportions. Something, it is true, may be said with regard to the setting of fireplaces, as well as to their construction; but we do not purpose to enter into this question in the present article.

Perhaps one of the greatest treats that a cook could enjoy is to be served with a dinner cooked by some one else. The reason of this is, that the constant smell of cooking nauseates the stomach, making it, by the sympathetic action of the several nerves of the system, disinclined to receive what it has so long anticipated through the action of the senses. Similarly, also, the mistress of a household enjoys nothing better than to get some one else to superintend the ordering of her several meals. But if this is caused, to a certain extent, by a mere knowledge of what is coming, how much more must it be the case when the smell of cooking—as too often occurs—pervades the house as well as the kitchen; and in some instances the smell of dinner will be perceivable in other parts of the house to a greater extent than in the kitchen. To a delicate person this is sufficient to entirely destroy the appetite, and it is due solely to defective construction. The cook is too often blamed when the architect is in error; and, while few know where to assign the fault, fewer still know how to remedy it; but it may be taken

for granted that the evil will not disappear from amongst us, until the art of house construction is based upon a more scientific principle than it has hitherto attained. Art and decoration, and the convenient arrangement of accommodation, occupy, in the present day, far too much of the consideration of the architect; whilst sanitary arrangements are neglected, and the healthfulness of buildings suffers in consequence.

In order to arrive at a true appreciation of the causes that lead to the kitchen being a nuisance in a house, instead of, as it should be, the means of imparting pleasure and comfort, we must consider first, what is a smell, and how it is conveyed. A smell then—and here we are referring, it will be understood, to a smell that ought not to exist—is matter in a wrong place, and, consequently, it is *dirt;* and not only is the smell of cooking, when it pervades a house, dirt in a scientific sense, but it is so absolutely. The smells arising from cooking consist of minute particles given out from food of all kinds, owing to the partial chemical decomposition which takes place during the application of heat, and which are carried off and mixed with the surrounding air by the steam, or other vapours arising therefrom. With a properly constructed kitchen range and flue, these will all be conveyed up the chimney, and carried away into the atmosphere above the house. In such case they are harmless, and become immediately, so to say, deodorised, by admixture with a preponderating amount of atmospheric air When, however, they are permitted to escape into the house, they do not meet with a sufficient quantity of air to render them innocuous; and, upon condensation of the vapours by which they are conveyed, they will settle upon the interior walls, and gradually cover them with a coating of grease and vegetable matter. These, if not constantly removed, will accumulate, and in time decompose, giving off still more objectionable and unhealthy smells, but which are not so noticeable, in consequence of the more powerful odours arising from a continuance of that evil from which they first had their origin.

It will repeatedly be found that the smell of cooking is strong in other parts of the house, and especially upon the floor immediately above the kitchen, whilst the kitchen itself is apparently free—or almost so—from the inconvenience; and the reason of this is, upon a little consideration, made perfectly clear and intelligible. We shall endeavour, in our next article, to explain the cause, and then point to the remedy; for to whatever extent the evil may exist, its modification—if not its entire remedy—is simple, however defective the kitchen chimney and range may originally be.

F. C. Danvers.

DOMESTIC RECIPES.

The Editor desires to appeal to his readers, and especially to the ladies, for contributions of recipes for cheap, tasty, and serviceable dishes, both for poor households and those of the higher classes.

PRESERVATION OF MILK.

The following method of preserving milk is given in a French technical journal as discovered by MM. Grapin and Rogier. To each litre (1¾ pint) of new milk add 1½ ounce of bicarbonate of soda or potash, then close the bottle and place it for about four hours in a hot water bath, heated to just below 194° Fahrenheit. When the bottles are withdrawn from the bath, dip them in melted pitch, and the milk will keep for a long time without alteration.

WHAT TO DO WITH THE REMNANTS.

Many prescriptions have been given for the employment of the cold remains of a joint; but, with the assistance of Baron Brisse, we offer a new method likely to produce a more tasty result:—Cut some mushrooms in small slices and steep them in butter. They must then be boiled in stock with a bouquet of herbs, containing a head of garlic in the centre. When the mushrooms are cooked, skim the fat off the sauce, and add capers, anchovy, and a very little vinegar or chopped pickled cucumber. Thin slices of cold roast beef must then be placed in the sauce, and warmed, though boiling should be carefully avoided. When these injunctions have been strictly executed, it is then incumbent on the cook to taste the sauce, and sprinkle the quantity of salt and pepper necessary to insure a good flavour. In serving, let the pieces of meat be placed on the dish in the shape of a crown, and the gravy poured over the whole. The bouquet is of course carefully removed.

[We will, in a future number, give other recipes for utilising cold joints.]

SAGO JELLY.

Boil well a teacupful of sago in 3½ pints of water; when cold, mix ½ pint of the juice of fresh fruit or raspberry syrup (rhubarb syrup will do); boil five minutes, and sugar to taste.

JUGGED HARE OF COLD MUTTON.

Cut up the mutton into thick, square pieces, resembling the back of a hare; season with pepper, salt, allspice, pounded mace, and a little nutmeg; put into a jar, with an onion, a clove or two, a bundle of sweet herbs, a piece of coarse beef, and a tumbler of porter. Tie the jar down with a bladder or strong paper; put it into a saucepan of water, up to the neck, but no higher; keep the water boiling five hours; before serving, boil the gravy up with a piece of butter and some flour; if the meat gets cold, warm it in this, but do not let it boil.

NOTES OF THE MONTH.

CONSUMERS of cheap tea will be gratified to learn that another ingredient besides tea refuse and filth has been discovered to enter largely into the composition of the abominable stuff called "Moning siftings," *alias* "Maloo mixture." The Shanghai papers aver that in the house of a well-known manufacturer of this rubbish was lately found a large quantity of leaves gathered from a peculiar kind of willow that grows abundantly in the neighbourhood of Shanghai, "numerous specimens of which may be found sprouting into delicious freshness on the sides of the Bubbling Well road." It may be easily imagined that an ingenious people like the Chinese would find but little difficulty in transforming, by skilful manipulation, these undoubted willow leaves into the likeness of genuine tea. For the information of Dr. Letheby, we may add that, by recent advices, 30,000*l.* worth of the "Maloo mixture" was on its way to this country.—*Globe*.

AN effort is being made by the Russians to establish the tea plant in their newly-acquired territories of Turkestan, the soil and climate being very much the same as those of the best Chinese territories. Competent judges have already pronounced an encouraging opinion of the experimental plantations, and it seems probable that at no distant date the Government of Turkestan will be reckoned among the tea countries.

FROM the *Gardener's Chronicle* we learn that the asparagus trade in France is an important one, and becomes more so every year. There are three regular kinds recognised in the Paris market—the early, or "Asperge en branche" as it is called, which is cut when it has reached two centimètres (four-fifths of an inch) above ground, the season for which generally commences about March 25, when the bundle never costs less than 10fr., or 8*s*. wholesale; secondly, the intermediate, which requires no explanation; and, thirdly, the late kind, or "Asperge aux petits pois," which is usually cut up and dressed with sauce like green peas, and eaten either as a separate vegetable, or as sauce to certain meats; it is also much used in soup. Another kind comes from the south; it is long and green from tip to stump, and the flavour is excellent; but it is not the fashion in Paris; it is too cheap! Prize asparagus is grown of great size in the neighbourhood of Paris, the maximum attained to the present time being 8 in. in circumference, though a dish of this vegetable costs 40fr. or 50fr. The consumption has become enormous of late years. In 1820, Argenteuil, the chief place of its growth near the capital, only sent to market about 5,000 bundles; now the produce probably exceeds a million. The price in Paris ranged the other day, at the wholesale market, from 15*s*. to 16*s*. per bundle. Except at the very commencement of the season, asparagus is constantly given even at 2fr. dinners in Paris; it is served hot, with white sauce, as with us; but quite as frequently it is eaten cold, with a little oil, vinegar, salt, and pepper; and, although at first a little odd to an English palate, it is very good eating.

A New Potato Peeler.—This is an invention of a French monk, and is thus described:—The tubers being roughly washed, are placed in a fixed upright iron cylinder pierced with holes, the edges of which cut like the teeth of a rasp, a moveable bottom to the cylinder being pierced in like manner; the potatoes being placed in this cylindrical rasp, motion is given to the bottom by means of toothed wheels, while a fly wheel regulates the motion. Above the cylinder is a tank with a tap, by means of which the potatoes are washed while being rasped, the peelings, or rather raspings, being caught in a receptacle placed beneath. It is said that with the aid of this machine a man may, without fatigue, prepare from 500 lbs. to 1,000 lbs. of potatoes per hour, according to the nature of the tubers. We can imagine such a machine doing its work well enough, except in extracting the eyes; and in preparing large quantities this would be a great saving of time. When an American first introduced a kind of watchmaker's turning tool for peeling apples, the invention was hailed with unconcealed laughter, but that machine, or something of the same kind, is now largely employed by those who prepare apples for jelly, etc., and we do not see why the potato rasp should not find a similar occupation.

Perhaps the most extraordinary instance of excessive and depraved appetite on record is that of a French soldier, named Tarare, whose case is described in vol. xxi. of the "Dictionnaire des Sciences Médicales," by Dr. Percy. He was born near Lyons, and came up to Paris, where his first exploit was to eat a basket of apples—at a friend's expense. On various occasions he swallowed a series of corks and other indigestible materials, which produced such violent colic, that he was obliged to attend the Hotel Dieu, and, whilst being examined, almost managed to swallow the watch-chain and seals of the surgeon in attendance, M. Giraud. Desault, on the occasion of one of these attacks of colic, tried to frighten him out of his gross habits by declaring that it would be necessary to open his stomach, and arranged the instruments; he ran away, and relieved himself by copious draughts of warm water. Soon after he found that his appetite had really increased to an excessive amount, probably owing to the continued irritation produced by these absurd tricks. At 17 years of age, when only weighing 100 lbs., he could eat 24 lbs. of beef in as many hours. He now entered the army, and being recognised by the Surgeon-Major, M. Courville, of the 9th Regiment of Hussars, he was detained for the sake of curiosity. From the day of his admission, he was ordered quadruple rations, with pickings and waste meat, but often slipped into the dispensary to finish off a poultice or two. One day he was observed to seize a large cat; and, after sucking its blood, left, in a very short time, only cleanly picked bones, the hair being rejected in the course of about half-an-hour, like other carnivora. He was fond of serpents and eels, swallowing them whole. On another occasion he consumed in a few minutes a repast, spread out for fifteen German workpeople, of milk, etc., after which he was blown out like a balloon. In the presence of some officers he swallowed, at one sitting, 30 lbs. of liver and lights. His insatiable appetite was for once in his life made useful by his being selected to convey a correspondence between General Beauharnais and a French colonel, which was inserted in a box and swallowed; but he was caught and soundly thrashed. He fell under suspicion of having eaten a child fourteen months old. It is stated that he was of mild and gentle manners and aspect. After death his stomach was found to be in a very diseased condition.—*Nature.*

CORRESPONDENCE.

Under this head the Editor will acknowledge, and as far as possible answer, the questions of his correspondents.

W. P. H. (Cornwall) is anxious to know how to prepare or procure glucose, which was recommended for making bread from whole wheat (No. 1., p. 29). Glucose, commonly so called, is a sugar produced by the "hydration" of starch; in other words, the oxygen and hydrogen combined in those proportions which constitute water, but in a state of "chemical" and not "mechanical" union with the starch. It is found naturally in honey and fruit, such as grapes, from which it is often called grape sugar. . It is roughly prepared on the Continent by boiling potato starch with very dilute sulphuric acid, the acid being subsequently neutralised by lime; but this glucose is never very pure. The best and cheapest way to procure it pure and ready made, is to apply to Mr. Manbré, Booth Street, Spitalfields, who is a large manufacturer of patent glucose or malt saccharine used for brewing.

Coca.—We have had numerous questions on the subject of coca. Messrs. Butler and McCulloch, of Covent Garden, formerly kept a supply of these leaves, but there was so little demand for them, that they did not think it worth while to renew them when finished. Mexico and Bahia are the best countries from which to obtain it, and the price in England is about 6*d*. per oz. If a sufficient number of readers will unite in taking a few pounds of coca leaves, we shall be most happy to assist in procuring them.

NOTICES OF BOOKS.

We have received the following:—

"The Manufacture of Beet-Root Sugar." By William Crookes, F.R.S. Longmans', Green and Co.

"Village Sanitary Economy and Sewage Utilisation." By J. Bailey Denton, F.G.S., C.E.

"The Cheapest and Best Foods." By F. Wilkins, C.E.

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THE

FOOD JOURNAL.

THE WAR AND OUR FOOD SUPPLIES.

But a few days since, there were those who would have asserted that the effects of a severe drought on the pasture lands of England, and especially of France, would, in the main, be rectified by increased imports of animal produce from Eastern Europe. It is time that the opinions of others, who have aimed at the complete development of our home resources by the eradication of diseases which have penetrated these islands, should have gained ground. Many opportunities and very precious moments have been lost during the many months in which we have been seeking in vain for the brilliant results of last year's legislation,—results which Lord Airlie referred to in the House of Lords, on the occasion of the third reading of the Contagious Diseases (Animals) Bill of Ireland, when he alluded to the propagation of the pleuro-pneumonia in cattle.

Thirty years ago Holland suffered from an invasion of cattle disease. It proved to be a contagious affection of the lungs; and our Irish neighbours imported a few Dutch cattle, and with them the malady that has ever since devastated these islands. The Dutch had previously been prevented shipping their live-stock across the German Ocean. They bred cattle of considerable value, and exported many to the Rhine provinces. Free trade opened our ports, and a stream of kine, sheep, and swine set in westward towards our shores, which has steadily been widening its basis, and resulted in a confluence of many tortuous currents, stretching from Gothenburg to Pesth, and blending mostly about Hamburg, Tonning, Harlingen, Rotterdam, and Antwerp.

We have not far to seek the nature of changes in the cattle traffic which must accompany Continental wars. We now have France needing all the animal food that can be spared for her, reduced by the failure of the grass crops, which has compelled her farmers to slaughter lean and immature cattle, as well as to refuse any longer to feed the horses *en reserve*, billeted on them by the War Department from motives of economy, and to be in readiness for *the urgent demand of any moment*. On the other hand Prussia, with Poland and the Russian Steppes in her rear, only fears the cattle

plague, as a drawback to the thronging of cattle droves on its railways and high roads. The lean and footsore herds of Muscovite merchants and Polish Jews will be welcomed; and, in the heat of battle, none will care for the stray oxen dead by the roadside, and none will think of the devastating plague which steals right and left, springing from the fetid effluvia of pestilent droves, and ramifying wherever the sleek cow or steer of the thrifty Prussian proves susceptible to the disease.

It is not our intention at so serious a crisis to favour the exaggerated theories of alarmists, or to run any danger of error on the side of those who consider that for roast beef England still reigns supreme. We seek the truth, and whilst we assert ourselves, as rational men, out and out free traders, we believe that the experience of the next few months—only weeks let us hope—of suffering and suspense, will demonstrate that *free trade in live-stock* is by no means synonymous with *free trade in meat*. France will now get meat whence she cannot get live-stock. Her soldiers and sailors will eat the salt beef and pork of Cincinnati, Chicago, and St. Louis. Prussia will probably suffer—she will certainly suffer if the war be prolonged—from her native animals being stricken by contagion; and England, that has hoped so long and so much from the resources of the East, will be left to seek for plenty in her own evergreen fields, and trust that some day her pre-eminence over the seas may render her independent of the transportation of a few hundred bullocks and sheep weekly from shores nearest her, by securing the produce—dead, not alive—of healthier, though more distant lands.

Taking the British Isles as a whole, the supply of foreign stock for consumption does not amount to more than 4 per cent. The metropolis, it is true, receives over 20 per cent. of its total meat supply from abroad; but a fifth of the consumption of London amounts to only 2¾ per cent. of the consumption of the United Kingdom; and reliable cattle disease statistics indicate a certain means, whereby we could at least rely on a speedy addition to our home supplies of 2 or 3 per cent.,—indeed, of quite as much as the Continent has given us during the years of our largest importations. We do not believe that we shall starve; and, if the Continental imports are restricted to the steers which we derive from Spain, the complete prevention of the foot-and-mouth disease will rather tend to give us an advantage over days of a thriving and open traffic, *via* Hamburgh, Holland, and Belgium. We may secure some cattle from Jutland; but all depends on the nature of alliances offensive and defensive, and on the duration of the war.

It would clearly suggest itself that our Canadian provinces might reap the benefit by exporting to us their surplus stock. We shall receive some salt beef in tierces, but the desideratum would undoubtedly be a steady supply of fresh beef. The Canadian steer and sheep are well suited to the English markets. The first is a short-horn cross, and the second a long-woolled half-breed, with Lincolnshire, Leicester, and Cotswold blood in varying proportions. The only objection to the sheep is their excessive fatness. We have seen at Christmas time Canadian wethers in quantities averaging nearly 200 lbs. dressed, and exceptional ones far exceeding this weight. Canada can, therefore, help us out of a difficulty, if we are compelled to seek for animal food in the New World.

There is no reason for a panic, as in the wheat trade, which, indeed, has been unjustifiably convulsed, when we consider that the granaries of Western America keep growing in capacity, and that large quantities of grain can reach us from the West as well as from the Black Sea. So far we depend for our daily foreign supply of meat on the European Continent, but the amount of that supply is by no means calculated to excite any fears of impending famine. On the contrary, but for the drought that has impeded the fattening of our herds, the temporary closure of the ports eastwards might be considered an actual boon.

The approaching curing season promises to be an active one. Stocks are low in the States and in Liverpool; and, on the declaration of war, prices advanced 10 per cent. They will go higher, and should the war last to the end of the year, the supply of salt provisions cannot equal the demand. The cooked meats of Australia are being bought up, and we are credibly informed that the French were in the market, laying their hands on a good deal, some days before the declaration of war.

In the long run, France will have serious difficulties in providing meat for her army, unless a successful invasion beyond the Rhine places at the disposal of the French soldier the abundance he so readily, and often so unscrupulously, appropriates. Protracted fighting on the frontier can scarcely be anticipated, or France would suffer severely from want of provisions.

All that the Prussians have to do is to recall the disasters at the end of the last and the commencement of the present centuries. To the horrors of war were added the miseries attending the unchecked extension of cattle plagues, which inflicted the greatest suffering on peaceful as well as warlike nations. With foresight and wisdom these accidents may be averted, and we have deemed it our duty to forcibly draw attention to them.

NATAL AND ITS FOOD RESOURCES.

The Colony of Natal, an offshoot from the original South-African settlement known as the Cape of Good Hope, consists of eleven millions of acres of land upon the south-eastern rim of the great African continent. This land lies upon the seaward slope by which the great African table-land descends to the Indian Ocean. It is comprised between the 27th and the 31st parallels of south latitude; and its most northern point comes within 220 miles of the southern tropic. The immediate coast district rises rapidly to an elevation of 800 or 1,000 ft., and the capital of the colony, at a distance of 46 miles from the coast in a straight line, is 2,000 ft. above the sea. Between the capital and the northern or inland frontier, the hills rise gradually to a height of 6,000 ft., so that, with a bold and broken contour, and these steep gradients, the land has rapid and ever-running streams. The mean annual temperature is 64° in the midland districts, and 69° on the coast. The mean annual rainfall is about 30 in., of which four-fifths most beneficently falls during the six months of highest temperature and most energetic vegetable growth. Some considerable portion of the land is rugged and bare rock; but there are also very large stretches of excellent soil, in places clothed with evergreen timber or bush, but more commonly presenting itself as open pasture. covered with luxuriant grass during the season of heaviest rain. It will be readily conceived that a land thus placed and circumstanced must possess very considerable capabilities in the matter of food production. With the application of capital, industry, and skill, it may be expected to play a very important part in the future history of that industrial economy by which the necessaries and often the luxuries of life are provided for the rapidly-multiplying race of mankind. Indeed, even at the present time, the little colony is able to render a very creditable account of itself in this one particular, notwithstanding some obstructive difficulties against which it has yet to struggle. At the present time, after 35 years of civilised occupation, and 27 years of English rule, the European population does not amount to 18,000. The colony has been hitherto pretty well barred from attracting any large or rapid flow of settlers to its shores on account of the high rates for the sea

passage, and of the large amount of cheap labour that is furnished by the native population. For these combined reasons Natal has not been found to be by any means the best place for poor immigrants who have to look to daily wages for their daily bread, and who have empty pockets to start with. Yet poor immigrants of this class are precisely those from whom the chief supplies of a colonial population are drawn. The increase of the white population of Natal from all sources amounted to only 537 individuals in the last two years, yet within the same period the increase of the value of exports amounted to the very considerable sum of 132,257*l.* The value of the exports in the year 1867 was 225,671*l.* In the year ending December 31st, 1869, it was 357,928*l.*, of which very nearly the whole amount was derived from agricultural produce in some form or other. In the last year the increase of the value of exports was 33 per cent. upon the return of the previous year. In the year 1869, the value of the exported articles sent out from the colony, as the surplus of its year's industry, amounted approximately to 13*l.* sterling per head for the numbers of its white population.

The early industries of Natal were almost entirely of a pastoral character. The first settlers in the territory were Dutch farmers who came down from the high inland frontier as emigrants from the old Cape Colony, driving their herds of cattle before them. In the year 1840 there were about 6,000 of these Dutch settlers in Natal, whose wealth consisted almost entirely of land, of the natural increase of their cattle, and of dairy produce. Each man occupied about 6,000 acres of pasture, and it was no uncommon thing, at this period, for a Dutch farmer to send down from 4,000 to 6,000 lbs. of salt butter to market as the produce of one year.

During the earlier years of the settled occupation of Natal, the oxen multiplied marvellously upon the rich natural pastures. Teams of huge horned Africander oxen might be constantly seen coming down into the capital from the hills, with some patriarch of the uplands, which for plight would well have borne comparison with the stall-fed cattle of modern English agriculture. In the year 1855 the colony was, however, visited by the epidemic lung sickness in a fatal form, and the increase of the cattle was for a time summarily checked. Soon after that period the price of the ox rose from 3*l.* to 10*l.*, and even 12*l.* a head. It was estimated that the cattle in the colony, which had previously been considerably more numerous, were reduced in the year 1857 to 102,000, and in the year 1859 to 84,000. From that period the ravages of the disease diminished, and at the end of the year 1868 the cattle on the pastures of Natal were again estimated at 500,000 head.

Cattle do not thrive well in the low warm coast districts of Natal; or, rather, they are prone there to sickness and casualties, which are much less strongly felt in the higher region. But throughout the entire up-country district, commencing a few miles from the sea-coast, stock farming is thoroughly naturalised, and as successful as it is in most of the temperate countries of Europe. During the spring and early summer the grass upon the hills is of extreme luxuriance and abundance. In the late autumn it becomes coarse and dry, and with the commencement of the winter season is ordinarily burnt off the ground, to make way for a tender young herbage with the fresh rains of the succeeding spring. This peculiarity points to the important necessity, which is only just beginning to be recognised by the farmers of Natal, of providing artificial or green food of some kind, for the support of the live stock during the period of deficient grass. In other words, the stock farming of Natal will have to be much of the character of the best farming in England, where the ground is well tilled in order that it may make beef, as well as corn. When this change from the old Boerdom practice of stocking the land with just so many animals as can manage to sustain life on the wild and unimproved pasture has been adopted, there is practically no limit to be placed to the beef-producing capacity of this favoured colony; which, it must be also borne in mind, is but the entrance to the millions upon millions of acres that lie in the elevated plains of the Orange River and Transvaal districts, still held by the Dutch, beyond the inland frontiers of Natal. The 500,000 of the present day will most probably seem a very poor tale by the side of the returns of another decade.

Before the year 1855, woolled sheep were almost unknown in Natal. The natives for some considerable time before that period had possessed what was, *par excellence*, designated the Kafir sheep; an ugly, coarse animal, which has a quantity of hair mingled with its imperfectly and scantily-developed wool, and which is now generally held to be a variety of the Siberian goat, rather than a true sheep. The flesh of this animal, and of the true goat, were the only forms of mutton that were seen on the tables of Natal colonists fifteen years ago. It was at that time considered that the climate of Natal was too hot for the merino fleece in any form. When, however, the Dutch farmers began to suffer from the lung sickness among their herds, it occurred to some of the most astute of them that it might be well to put this old dogma to the test of actual experiment; and some woolled flocks were accordingly brought down from beyond the mountains into certain selected

localities. In the year 1857, in consequence of this movement, there were found to be about 37,000 woolled sheep on the pastures of Natal. The experiment has been so eminently successful, that mutton is now seen on every man's table; and, a year ago, the return of woolled sheep in Natal was 250,000. It is not, however, every locality, even in the uplands, that is suitable for sheep, to say nothing of the low coast districts, which are totally unfit for them. The sheep farms need to be chosen, and the sheep require to be managed, under the guidance of local and technical experience, and intelligent skill. Sheep will certainly be among the most valued resources of Natal farming; but, in all probability, the aim of the farmer will be to produce improved breeds yielding the most valuable qualities of fleece, and to pasture these in small flocks upon highly cultivated land with great skill and care, rather than to have very large flocks running wild over the natural pasture after the fashion of super-eminently pastoral regions, such as the plains of Australia. As in the case of cattle, so more emphatically in regard to sheep, it will be absolutely essential for the farmer to provide liberal stores of winter food by the tillage of the ground. The coarse, dry, winter herbage, which is unsatisfactory for cattle, is tenfold more unsatisfactory for sheep. Fortunately there is no lack of suitable material to be drawn upon for this emergency. It will only be necessary to say that Indian-corn, beet-root, and pumpkins, grow everywhere with the utmost facility and luxuriance, and are all well suited to be kept in winter store. Under these circumstances, it is quite safe to affirm that Natal mutton will follow the lead of Natal beef with no very halting or uncertain pace. It should perhaps also be added, as not unworthy of remark, that the Angora goat, the Kafir sheep, and the common goat, which severally yield mutton by no means to be altogether despised on an emergency, all do well, even in places that seem to be unsuitable for the less hardy wearer of the woolled fleece.

Maize is the most thoroughly naturalised, and, in consideration of being the most universally available artificially produced food, alike for live-stock and for the numerous native population of the colony, is the most important of the grain crops of Natal. In all probability it has been introduced to the acquaintance of the native races of South Africa through the instrumentality of the Portuguese settlements in the Zanzibar district of the eastern coast. At any rate it is now known more or less intimately and favourably to all the native tribes. In Natal it is literally the native's staff of life. The ordinary ration of the Kafir in the service of a white master is three pints of Indian-corn meal per day, and very commonly he

gets nothing else when not within easy reach of an occasional allowance of meat, and manages to be in good and sleek plight upon that allowance, even although at all times ready to share his allowance with chance acquaintances who know the breakfast or dinner hour. In his wild state the Kafir adds a species of millet, distinguished as Kafir corn, to the maize, which is consumed after partial fermentation as a thick drink called "tchualla," but ordinarily spoken of as Kafir beer. Two bushels of maize are, however, now grown for every bushel of millet, even in the purely native districts of the colony. At the present time about 77,000 acres, representing in round numbers 120 square miles, of land are cropped with Indian-corn, and the yearly yield of this important grain is estimated at about 780,000 bushels. Under wild native cultivation the land yields from 15 to 20 bushels per acre. Under the superior management of white men's cultivation the yield is from 45 to 60 bushels per acre. There is no doubt that maize will be always grown in Natal to the full measure of its own internal demand; and that, when once the difficulty of extravagantly costly internal transport of heavy commodities has been overcome, it will be made an object of extensive import over and above what is grown for internal use. At the present time it is found that two thirds of the value of the grain in the home market is consumed by the charge of internal transport and sea freight, and this acts virtually as an effectual interdict to the export of the grain. The only way in which the Natal farmer can circumvent this difficulty at the present time is by converting his maize into bacon, which is of course more easily transported than the maize from which it has been fed. The 50,000 lbs. of cured bacon which now annually appear in the list of Natal exports must be looked upon, in the main, as Indian-corn concentrated and condensed for purposes of transport. From this statement it will therefore be apparent that pigs also must be entered in "red letter" in the record of the food resources of Natal. Pigs fatten most admirably upon maize; and in all the up-country districts, at least, bacon can be most successfully cured during the six colder months of the year.

R. J. Mann.

[to be continued.]

It appears, from the last published report of the Soldiers' Daughters' Home at Hampstead, that the average expenditure upon each inmate during the past year has been 21*l.* 1*s.* 0½*d.*, being a reduction of 13*s.* per head upon that of the previous year.

HOW FOREIGNERS LIVE IN LONDON.

Part II.

If in this short article I leave Italians, their restaurants, and style of cooking aside, and seek my material in a French kitchen, it is not that I have exhausted the subject, but that I hope to relieve the reader by a constant variety. Indeed, in this I am not altogether unselfish. Variety of food is always wholesome and pleasant. Therefore, having described the Italian restaurant, which is chiefly frequented by the opera chorus singers, I thought I would dwell next on some poor French *guinguette*, where the half-starved Frenchmen of Soho seek their meals. But, alas, though the spirit was willing, the flesh was weak. I entered the restaurant "Colineau," situated in a little street within sight of Wardour Street, with a courage worthy of my mission, and ordered, among other things, a mackerel *à la maitre d'hotel*. But my testing was brought to a summary conclusion by the melted butter, flavoured with something which reminded one of rotten lemons and bad vinegar. However, in researches like mine, the old proverb, "Nothing venture, nothing have," is especially appropriate. Indeed, the great fault of our poor and ignorant classes, and sometimes of their superiors also, is that they will never adventure themselves in matters appertaining to food. There is a prejudice against, and a dread of, "foreign messes;" and certainly the experience I have just related, might confirm this superciliousness. But smoke may come from a very small fire; and, if the reader will follow me patiently, he will discover, notwithstanding an occasional indigestion, that the foreigners who inhabit London give us practical examples in domestic affairs which might be of great value, if our prejudices would only allow us to profit by them.

For instance, I witnessed in another French restaurant a dispute which was certainly not without a pregnant moral. The restaurant in question was opened only a few weeks ago, and is situated at the corner of Ryder's court, Leicester Square. On the outside are flaming placards announcing that the business is carried on *à l'instar de Duval*. Certainly of all the public caterers, M. Duval was one of the most successful and the most worthy, though unfortunately his London imitator falls short of the model; still, allowances must be made for the difficulty of the situation. M. Duval's great object was to furnish cheap dinners to the middle

classes, who objected to dining with common labourers, and yet could not afford the extravagant charges of a first-class restaurant. I do not know whether M. Poy, his London compeer, can hope ultimately to satisfy the same demand, but at first the influx of customers was of a very strange and mixed description. This fact gave rise to the little incident to which I have already alluded. Among others a French workman, or rather a navvy, strolled in, took his seat, and ordered a bowl of *bouillon*, or broth, price 2*d*., and a piece of bread, price 1*d*. When the waiter perceived that the workman had nearly finished his soup, he approached, and politely asked what else he should serve him. This question produced a startling effect. The workman sprung to his feet, swore the most terrible oaths of his language, calling the waiter an impertinent, ignorant, and ill-mannered fellow. Then followed a violent harangue, in which the workman appealed to all in the room, asking us whether it was fair that, just because he wore a workman's *blouse* and laboured with his limbs, as well as with his fingers and brains, to earn a livelihood, he should be publicly insulted. At first this conduct seemed most preposterous, and I was about to enlist my sympathies on the side of the astounded and terrified waiter, when fortunately I remembered that in France there exists a certain law of etiquette which, if it were observed here, would render the objections of the workmen both reasonable and fair. The law in question applies to humble restaurants where the poor of Paris are wont to resort. In these places it is a rule never to ask a customer what he will have, as such a question might imply that the waiter expects him to have more than he has already ordered; and to express any such thought would naturally produce a most disastrous effect. When a man has but two or three pence in his pocket, it is not pleasant to be asked whether he will have jugged hare and a bottle of wine; while, on the other hand, the refusal to take more than, in this instance, soup and bread, suggests to all around that the customer has no more money in his pocket. This is naturally most disagreeable; and, therefore, a kind and truly refined sense of delicacy has suggested the rule that in restaurants frequented by the poor, the customers should be left unsolicited to order what they wish. There is something so benevolent about this thoughtful rule, that I immediately took part with the workman who sought to establish it in England. It is right to say that in some foreign restaurants of London this etiquette is strictly observed—the customer is left entirely to himself; and an example is thus afforded to English houses of similar description, which they would do well to follow.

ADOLPHE SMITH.

THE LIFE OF THE WORKING WORLD.

HOLLAND.

It is a trite and well-worn saying with us, that "the one half of the world does not know how the other half lives;" and, to my mind, it conveys with it a tacit reproach that, as far as our own country is concerned, we are exceedingly apathetic as to the lives and deaths of our fellow creatures. It is unfortunately true that the bulk of the educated classes are still very ignorant of the habits, customs, thought, modes of living, peculiarities of labour, and sanitary conditions of that large army of workmen, which makes up seven-tenths of the population of England.

Perhaps in a country like this, where class distinction is so rampant, such ignorance cannot be avoided, nor is it wise, in many ways, that the barrier should be broken down too rashly; but it surely cannot be good or right for inhabitants of the same kingdom, living under the same conditions, speaking the same language, and actuated (I would fain hope) by the same *amor patriæ*, to feel that they are divided by a gulf as impassable as that between Lazarus and Dives. It is certainly true, and satisfactory moreover, that a great deal of knowledge on these subjects has been diffused of late years, opened up by the various social questions of reform which we have been endeavouring to solve; but still the knowledge is sadly too limited to politicians, philanthropists, agitators and blue book readers; and I maintain that every educated man should make himself acquainted, as far as his opportunities go, with the social condition of his fellows; for it is only by comparing this and that together, that really sound bases of improvement are formed.

Our information concerning the working classes has latterly been very much extended all over the world, so to speak, and I propose devoting a few articles to describing briefly their condition in various countries; their food, mode of living and lodging, resources and wages; for, after all, the question embraces, not only what people eat or have to eat, but how they can do the best with their money. Though food, lodging, and health are the points which most appertain to the province of the "Food Journal," I do not think that anybody will quarrel with my introducing any collateral facts which such an enquiry brings forth; for as the *mens sana in corpore sano* depends upon the harmonious working of all the intricate machinery of the human system, so does it in the body social.

I shall commence with Holland, partly because the Dutch are, of

all Continental nations, the most allied to ourselves in character, and partly because the occurrence of the Exhibition at Amsterdam, during the last year, has brought out a great deal of interesting knowledge concerning that country, as embodied in the reports of Mr. Locock* and the Hon. T. J. Hovell-Thurlow.† It must be owned that in many ways the Dutch are a good deal behind the times, though I think that nobody will dispute the opinion that they are much the happier for it: they are a self-contained, patient, saving, plodding people; perfectly contented to let their neighbours manage their affairs in their own way, as long as the same grace is accorded to themselves. "The Dutch labourer," says Mr. Locock, "whether in field or town, reflects on the value of his earnings: the energies which a warmer blood and a more impetuous temperament would expend in political excitement, he concentrates to the improvement of his own individual lot; the question of the hour, the news of the day, possess but little interest for him; he prefers his Bible to his newspaper, and his family fireside to the public-house. Jealous to a degree over the liberty he already possesses, he does not sigh for more, and prefers enjoying in peace the advantages already secured to him, to agitating for others which his fathers did without." It is in this happy self-content (call it phlegmatic, if you will) that the secret of their prosperity lies; for, though the Dutch workman gets lower wages, works harder and longer, and lives more sparingly than the Englishman in the same class, his home is happier, his family healthier, and he has, generally speaking, more sound and practical knowledge in his respective trade or avocation.

A skilled artisan, as a carpenter, plumber, or smith, gets about 16*s.* a week in the large towns, and not so much in the smaller ones, while his wife takes in washing or some household work, and he himself is not above doing an odd job when his other task is finished. This addition is not an uncommon feature, on account of the mode of payment of wages, which is generally by piece-work, or by the hour, at a rate of from 2*d.* to 4*d.* In summer, therefore, he earns more than in the winter, working generally for about twelve hours a day, including rest for meals, which at dinner-time involves an additional half-hour for the post-prandial pipe. Altogether we may say that a steady workman in a large town earns from 20*s.* to 22*s.* a week, and in the country 16*s.* or 17*s.*, though against this reduction he can put a lower rent, and a cheaper rate of living.

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* "Reports on the Industrial Classes, 1870."

† "Reports of H.M. Secretaries of Embassy and Legation, etc., 1870."

The family breakfast consists of coffee with milk and sugar, and what may be called "black bread sandwiches," a most universal article of diet in Holland, though perhaps more relished by the richer than the poorer classes, who usually prefer the white bread when they can get it. In this respect they agree with the tastes of the English workman, who turns up his nose at anything but the whitest bread. The black bread is made by machinery, and left in the oven for 48 hours, acquiring at the end of this time a very dark colour, and a taste and consistence something like soft ginger-bread. A slice of this is eaten at breakfast, placed between two thicker pieces of white bread and butter.

Meat is rarely tasted, except on Sundays, when it is the delicacy of the day—potatoes and other vegetables boiled in fat forming the staple of the ordinary repast, varied by fish, when in season.

But Mr. Thurlow tells us that there is a growing disposition to eat more meat; which perhaps may arise, as much as anything else, from the falling off of the fish supplies, owing to the over-fishing of the herring—there being no license required as formerly. The salmon, too, being subject to a close-time of only one month in the year, bade fair to have become altogether extinct, had not the intervention of Prussia secured a greater degree of protection for the Rhine fish. But salmon is with the Dutch, as with us, an article of diet mainly confined to the rich, and does not enter, like the herring, into the daily catalogue of the poor man's cuisine. Workmen in the country usually bring their food with them, and have it cooked where they are employed, paying a small trifle for the accommodation; but in towns, they go home, or to the cook-shops, where for twopence they get a substantial, if not very appetising, meal of vegetables and dripping.

As to clothing, the Dutch artisan is always well off—in almost all cases possessing a work-day and a Sunday suit. In the Amsterdam Exhibition there were a great many examples of the ordinary working suit, which certainly did not err on the score of dearness, although there was a certain bagginess of fit which would be undesirable in a person sensitive about appearance. A good suit of clothes for ordinary wear can be obtained for 18 florins (or 30*s.*) for a man—and at 14 florins (23*s.* 4*d.*) for a woman. This latter estimate has nothing to do with the Sunday attire, which is rather a point of honour with the fair sex, different degrees of ornament prevailing according to the province. Perhaps the point in which the Dutchman most resembles the Englishman is in his house accommodation, which it is actually necessary he should have to himself,—every man's house being his castle there as here.

Generally speaking, the artisan is fairly well-lodged, and particularly in the country—but in the large towns, as Amsterdam, there is a great lack of the most important sanitary conditions of life. I have seen there cellars far below the water-level of the canal, which is only divided from the apartment by a very narrow stratum of loose sandy earth; and it may easily be imagined what a damp cave of despair such a room appears, especially during the floods which frequently occur in the winter from the heavy rainfall; and yet Mr. Thurlow tells us, that these cellars (which let for 2*s.* a week) are preferred to dwellings in the *cités ouvrières*, solely because the latter are of a too gregarious tendency. There are, however, blocks of buildings, all of course on the same model, to be found in the outskirts of almost every town, for a house in which the rental is 2*s.* 6*d.* a week. This is about the usual standard in towns like the Hague; Amsterdam and Rotterdam not being nearly so careful in these matters as they should be. A very useful regulation has been passed of late years regarding these blocks, which requires that an open space be left in the front of every house. Each house, there being usually a dozen or so in the block, consists of a lower room, some 15 ft. square, lighted by one window, and fitted up with a stove and cooking range in the chimney. In the opposite wall are cupboards, which serve as pantry and larder; while a larger curtained recess forms the bedroom of the parents. In the room above the children sleep. There is no back-yard, but that is of little consequence, for the open space in front is apportioned into plots, where the clothes may be dried and the pots and pans scoured.

An experiment, which appears to answer, has been tried by some of the companies for building improved dwellings for the working-classes, viz., that of introducing the "flat" system, by which the lower portion of the house is occupied by one family, with exclusive use of a garden on one side of the house; while another family tenants the upper story, which is entered by an outer staircase on the other side, and entails the use of the garden on that same side. As the occupants of the lower part have to go outside their plot, round the corner, and up the staircase, if they wish to communicate with their topmost neighbours, it certainly gives a far greater degree of privacy than if they were simply next door. For these houses at the Hague, 2*s.* 1*d.* is paid weekly, while the upstairs lodger, who has the attics, pays 2*s.* 8*d.* One of the results of these improved dwellings is to be deprecated; inasmuch as they are in such request that a class of people rather above the labourer, take them the moment

they are vacant. This, however, is a matter of arrangement, and can be no argument against the extension of the system. I will now mention a few points which affect the Dutch artisans' *morale* more than his physical condition. Laws protecting him are very curt and scanty; there is no law to protect the young from working in factories under a certain age—or from working overtime—the principle being, that everybody knows what is best for himself and family, and will act accordingly. By the same rule, there is no law of apprenticeship, each lad being allowed to go and seek instruction in his trade where he likes, and to take his departure whenever he has had enough, or is dissatisfied. On the other hand, there is a law which, to the British workman, would seem especially hard. It is, that the right of combination is forbidden, to raise the price of labour or limit the hours. In fact, such conconduct is visited with punishment. It is partly owing to this, and partly to the innate steadiness of the Dutch, that there have been but two strikes known in Holland—one of Amsterdam shipwrights,—the other, of peat-cutters near the Belgian border. Both were insignificant, and both were speedily checked; for there seems to be that inherent feeling of the necessity for mutual accommodation, that makes the master willing to recognise any reasonable request—and the workman to feel that his interest is so bound up with that of his employer that nothing should occur on his side to destroy it. Would to heaven this were still the case with us! I have not space to follow out the numerous clubs and social societies with which, on the other hand, the Hollander is so well provided. Every town, almost every village, has its sick and burial club, its provident society, or its co-operative store. As good samples of these are the Netherlands Association for Abolishing Strong Drinks; the Zaandaam Society, or "Help Yourselves;" the Haarlem Society, of "Weten und Werken" (To Know and to Work); the Leyden Society, "Tot Not en Geroegen" (For Use and Pleasure); the Typographical Society, or Printers' Union, which embraces every man in Holland engaged in printing, from the publisher of the newspaper or book, down to the "devil." Although associations such as these are purely voluntary, there is scarce a workman in Holland who does not join one or more; and perhaps they are the only examples in the civilized world where pure good of self and country is sought to be obtained without the disquieting element of politics. The motto and prayer of the Dutch should surely be "*Quieta non movere.*"

PHILLIPS BEVAN.

PRESERVED MILK.

THERE is no difficulty with which Paterfamilias has to contend greater than that of obtaining a supply of pure milk adequate to the wants of his household. Even adopting the humourist's mode, and handing the peripatetic vendor two jugs, so that he may put the milk in one, and the water in the other, will not always succeed in preventing the addition of that most innocent of diluents. All milk vendors are not capable of appreciating irony. But there is another obstacle to a satisfactory condition of the trade, beyond this little difficulty of purity, which our Home Secretary seems to have made up his mind to accept as an inevitable necessity of modern trade, but which we entirely repudiate, believing that there are some few honest milkmen in town and country who still sell a pure article, and many more who would gladly do so if the rogues who vend the mixture, and trespass upon their customers, were exposed and fined. This is the difficulty, which exists both in town and country, of getting a full and abundant supply of the nutritious fluid.

The farmer, except in special localities, where dairy husbandry is the rule and practice, seldom has much milk to spare after his own family's necessities have been supplied. He grows mutton in preference to milk, and makes beef rather than butter. The cottagers' cows do not now pasture in the green lanes, for these are now called "highways" in the law books. The rural police, too, have orders on the subject, and there are yet rural Shallows to see that they "do their duty," and report at the "Petty Sessions;" so that the farm labourer, like the town dweller, is compelled to depend entirely on the cheap and nasty concoctions of the trade,—tea, coffee, cocoa, and sugar, such as it is—that he meets with. Beer would be a useful article of diet if it could be had home-made or at home, pure and cheap; but that cannot be allowed, as it would interfere with the licensing system and the malt duties! Systems, like that of adulteration, and all systems that interfere with the full supply of sound and useful food to hungry millions, are contemptible, and will be abolished as soon as the sacred right of every one individual to *eat* and *live* is recognised. Beer, however, can be had—at a price which makes it a luxury—as a stimulant, dear and drugged, and in a place where comfort and company may

tempt poverty to drunkenness, and where vice and crime are ever ready to seize the opportunity of enslaving new victims; but the system is profitable to the revenue, and so it must stand—for a time.

Now, if a full milk diet could be obtained for the children in every cottage, how often would the sickly infant live, the poor, ricketty child grow into an active boy, and the overgrown, consumptive-looking youth reach manhood. In fact, how much would the bone and sinew of the rising generation be strengthened, if children could have a liberal supply of milk food, instead of being brought up on washy substitutes, and kept quiet by sugar, stimulants, or opiates. The importation into this country of the pure condensed milk from Switzerland is another step in the right direction,—the amelioration and condition of the poor,—which modern science has taught us to take; and we also hail with hearty satisfaction the announcement that establishments for the preparation and supply of immense quantities of the condensed milk are now at work in the county Cork, Ireland. In this manner the "green pastures" of the sister isle may indeed be made to confer a substantial blessing upon the crowded and heated towns of England, whose population in infancy is stimulated into unhealthy and unnatural precocity, instead of being soothed and fed by nature's own food during the ills to which juvenile existence is subject.

Now we are aware that the same obstacles to a quick appreciation and adoption of this new diet for children will operate, that have retarded, in some measure, the use of the prepared essences of beef and of the preserved Australian meats amongst the lower orders, for whose especial benefit they are adapted. These classes do not in fact understand that the taste can be educated, and that a special and peculiar flavour must not necessarily be a bad one. For instance, we have one of fish, and another of flesh, and a third of fowl; and each and every article of one kind is different from those of another kind, and yet all are the works of God's hand, and good for man. The public have fallen into this error in testing the prepared foods that have been offered, but they are now finding out that, as good cookery can make palatable the hare, the rabbit, the wood-pigeon, the partridge, the pheasant, the grouse, the wild-duck and the goose, so it can render agreeable the special flavours of foreign preserved meats. Indeed, it is clear that all the birds of the air, all the beasts of the field, and nearly every creeping thing,—the ox, the deer, and the goat; the sheep, the pig, and the calf; the lobster, the crab, the oyster, and every variety of fish,—can be cooked in many ways, and in such a manner as to present the

special and peculiar taste of each particular article in its highest excellence. A similar rule operates in the case of vegetables, and of our various spices and condiments; and applies, if possible, still more to our drinks. The Usquebaugh and Glenlivat, the Cognac, the Pine-apple Rum and the Geneva, the Bass and Allsopp, the Dublin stout and Edinburgh ales, the countless Slings, Cocktails, etc., of America, and the well-known varieties of wines which the Champagne, Moselle, Burgundy, and Bordeaux districts produce, have all their own peculiar *goût*, and each, *sui generis*, may be the best, and worthy of a place on any table, where it can be had.

Let us, however, turn to the table where few of these varieties of food are seen—that of the poor man. He is, as we say, suspicious of a new taste in the food he buys; he has none of the accessories—condiments or cookery—to make it less strange to his palate, and he shrinks from venturing his pence in the purchase of novelties. Another impression which he has—and a very general one—is in favour of bulk in the food that he buys. He likes plenty for his money; and thus he unwittingly encourages the modern system of deterioration by admixture, or, in other words, by adulteration, in order that his provisions may appear to be cheap. All these circumstances to which we have alluded, operate to prevent the really poor families from trying to make use of a condensed article, and a novelty, however patent its merits may be, and however well it may be calculated to supply a great want in their households. What, then, we would suggest to philanthropists, is the desirability of extending a more liberal supply of milk amongst the houses of the poorer classes, whose families are now reared on artificial instead of natural food; and, as a means of doing this, at once efficient and immediate, we would propose that the condensed milk be freely and largely *given* to the necessitous, and also to the industrious, in our large towns, where the family is young or large. By this mode the value of the preparation will be practically tested, and a good and philanthropic object accomplished at the same time; for, having once found the benefit of the diet, and where to get it, people will soon begin to buy it for themselves; or, to travesty the words of Caliban, they will say—

> "You taught me knowledge;
> And my profit on't is I know what to buy."

In this manner medical men have taught hundreds to use cocoa, who never would have bought it for themselves in the first instance.

JOHN HANNAM.

DINING WITH A MANDARIN.

At the confluence of the rivers Yang-Tsze-Kiang and Han, in the province of Hoopeh, three Chinese cities stand within sight of each other, named respectively Hankow, Hanyang, and Wuchang. The first claims attention as being the entrepôt for the black teas prepared in the adjoining Moning districts, and on account of its marking the limit of foreign steam navigation on the Yangtsze permitted by the Imperial government; whilst the second, even including its suburbs, is unimportant. But the third, being the capital of Hoopeh, the residence of the Viceroy, governing both that province and Hounan, and possessing an extensive Confucian temple, fitted with 8,000 cells for the reception of students assembled to undergo the triennial examination, is well worthy of notice. On such an occasion it is dangerous for foreigners to visit Wuchang, as the young literati, partaking somewhat of the boisterous spirits and frolicsome demeanour which are the occasional characteristics of college students at home, are apt to indulge in practical jokes, which, if the visitor resents, usually terminate in a brawl. So well known is this, that it is customary for the foreign Consuls stationed at Hankow, on the opposite side of the river (here about a mile in width), to advertise the date and duration of each examination, and warn their respective countrymen to refrain from visiting Wuchang during their continuance. But it is precisely on such an interesting, though probably dangerous, occasion that the foreigner, bent on the acquisition of information, and especially desirous of an insight into Chinese social life, longs to stroll through the quaint old city, to linger about the shops, and enter the cloistered temple, as at that time a greater volume and variety of Asiatic life is to be met with than during any other period of the intervening three years.

It was, therefore, with a feeling of peculiar satisfaction that we became aware of an invitation to dinner at the house of a high mandarin, just received by our friend the Consul, and accompanied by chairs and bearers to convey us there. Whilst being jolted along by the coolies it may not be out of place to give the reader a few memoranda relative to Chinese food, and how some of it is obtained. As a race the Chinese are voracious, and to the foreigner accustomed to look upon the

appeasing of appetite as one of the minor duties of life, the epicurean idiosyncrasies of the wealthy, and the public and obtrusive feeding of the middle and lower classes, appear totally devoid of refinement. Omnivorous to a degree, there is not a creature or plant which art or industry can procure, capable of being eaten with safety, that is not used for food—dogs, cats, rats, sea-slugs, sharks' fins, grubs found in the sugar cane, dried silk-worms, earth-worms, mysterious roots, leaves and tendrils—all are consumed by high or low. The flesh of wild horses is much prized; the larvæ of the sphinx-moth, bears' paws, and other animal extremities are considered delicious; and edible birds' nests, the work of the *Hirundo esculenta*, a swallow which builds only among the steepest precipices in the islands of Malaysia, stand high in importance at a mandarin's dinner; and deservedly so in a pecuniary point of view, as this delicacy costs at the rate of 800*l.* per cwt. Sometimes served as an entrée, it is more frequently converted into soup, and brought to table along with another, composed of mare's milk and duck's blood. The species of dog usually cooked is a small delicate spaniel of dejected appearance, whose demeanour contrasts vividly with the noisy demonstrations of the wild Tartary cats generally exposed for sale by the same dealer; whilst the rats, large, plump, and by no means repulsive looking, are brought to market neatly prepared, and skewered ready for roasting. In addition to their ordinary plan of netting fish, the Chinese adopt two other methods which bear the stamp of novelty, and are not recognised by Izaak Walton in his instructions to the disciples of the "gentle art." Probably nowhere else would the idea occur to even the most impecunious fisherman to convert a dead countryman into bait. Sailing along river or canal, the traveller occasionally sees in the dusk of the evening, among the lotus flowers and fringes of reeds which border the streams, four stout coolies vigorously shaking an object over a basket. A nearer approach reveals the unusual sight of a corpse being denuded of the silver eels which have collected in it during the day. Where those exquisite and beautiful fish abound, the fishermen are on the alert to detain any remnant of mortality floating along, by tying it to a stake. Nightly the shaking of the defunct proceeds, and is continued time after time as long as the remains cling together.

At another point the foreigner has his attention arrested by the appearance of an open punt, with a well in the centre compartment, and perches projecting from the gunwale on the outside. On each perch two fishing cormorants stand side by side, while the fisherman propels the boat by means of an oar over the stern, and has within reach two long bamboos, one with a bag net at the end.

At a signal the birds bound into the water, and commence immediately to hunt for fish, the boatman meanwhile keeping a wary eye about him, so as to detect and visit with prompt punishment any attempt at surreptitious appropriation. Such vigilance is far from unnecessary, as the cormorant is so voracious, that if not watched, it would endeavour to swallow every fish it caught. As a preventive, each bird has a ligature fastened around its neck during fishing time, so that any unobserved attempt to gorge a creature larger than an eel, would result in speedy strangulation. When a fish is captured, the boatman holds out the bag net, into which the cormorant resigns its prey, usually without hesitation. Sometimes, however, the bird gets sulky, and, lagging behind the others, commences sporting on its own account. Its first capture may be of small girth, and is swallowed with comparative ease. Grown bolder by success, and less under fear of discovery than at first, its next attempt is probably made on a plump grilse—no matter, down it goes; and, of course, like an overgrown chimney-sweep in a flue, the fish sticks at the most critical point. The culprit immediately evinces symptoms of distress; and, flapping its wings on the water, attracts the sharp ear of the fisherman, who, sculling to the spot, lifts bird and prey into the boat, plucks forth the fish, and consigns the feathered thief to punishment by tying its feet to a perch, and depriving it of food for the remainder of the day.

But our chair-bearers at length succeeded in shouting and elbowing their way through the crowded city; and, having arrived at San-ko-lin-Sin's mansion, we alighted, and were ushered into a lavatory through a crowd of children; not little Sin-ners, however, as they are the progeny of the domestics, of whom there appears quite a multitude. Lavatory is perhaps scarcely the correct name to give an apartment without a roof, and whose only appointments consist in a caldron of boiling water, on the lid of which, neatly folded, are a dozen or two of crape parti-coloured napkins, one of which, after being dipped in the hot liquid and wrung out, is handed to each guest. A hurried rub over the face and temples, then around both hands, completed the ablution, and, without the further ceremony of drying with towels, that being left to evaporation, we proceeded to the smoking-room, at the door of which we were received with many bows and polite speeches by the host, and introduced to his friends. Opium and tobacco pipes were offered, as well as cheroots; but as we declined their indulgence, the way was led into the guest chamber, where we were seated with the strictest regard to the etiquette of rank and precedence. The interior of the apartment is usually of a costly and handsome

description, the walls and ceilings being decorated with fret-work and carved designs; the furniture a strange combination of the airy and substantial, the quaint and picturesque, whilst the numerous articles of vertu standing about, the scroll pictures and gaily painted lanterns depending by silken cords from the grotesquely sculptured beams, present a *coup d'œil* both unique and pleasing. The table is ornamented with a profusion of vases, in which flowers and fragrant perfumes are placed, ample space being left all round for the bowls of the guests. From the time when the host took his seat on the slightly raised platform at one end of the dining-table, conversation commenced and rarely flagged during the four or five hours of the feast. Meanwhile a company of comedians took up a position at one end of the hall, and awaited a signal at the completion of the first few courses to commence some favourite drama.

The dinner began by a cumbersome ceremonial of drinking a light wine made from rice, possessing somewhat the flavour of sherry. It was served hot, poured from a china kettle into little porcelain cups, and handed by a handsomely dressed boy on bended knee, while another passed round sweet biscuits made from buckwheat. During this preliminary course, the host not only drinks, but eats to each of his guests in succession, observing the strictest etiquette of rotation, and they in the same order to him and to each other, his every movement and gesture being observed, noted, and respected. The first course on the present occasion consisted of custards and preserved iced fruits, which was quickly followed by cold relishes, such as salted earth-worms, smoked fish and ham, Japan leather (an article of food possessing a strong and disagreeable taste), and pigeons' eggs, having the shells softened by vinegar. Gradually the feast became more substantial, and included basins of sharks' fins, birds' nests, deer sinews, and other dishes considered peculiarly nutritious and appetising. At length the real solids were reached, consisting of rice and curry, chopped bears' paws, mutton and beef cut into small cubes and floating in gravy; pork in various forms; the flesh of puppies and cats boiled in buffalos' milk; shantung, or white cabbage, and sweet potatoes; fowls split open, flattened, and grilled, their livers swimming in hot oil; and cooked eggs of various descriptions, containing embryo birds. But the surprise of the entertainment was to come. On the removal of some of the flower vases, a large, covered flat dish was placed in the centre of the table, and at a signal the cover was removed. The hospitable board immediately swarmed with juvenile crabs, which made their

exodus from the vessel with surprising agility. The crablets had been thrown into vinegar just as the guests sat down, and this treatment being obnoxious to the feelings of the crustaceæ, renders them irritable on escaping from their acid bath. Fast as they ran their sprightly motions were anticipated, and soon checked by each guest seizing the nearest, thrusting it into his mouth, crushing it between his teeth, and swallowing the strange morsel without ceremony. I determined to follow the Chinese example, and for once try a couple of infant crabs, which I found soft and gelatinous, as they are but tiny creatures, not more than a day or two old; but I was compelled to yield at the third. It had evidently resolved on vengeance, and, taking advantage of my want of dexterity in the management of chop-sticks, inflicted such a nip upon my lower lip that I relinquished my hold, and desisted from further experiments.

The conversation having been necessarily somewhat interrupted by the episode of the crablets, we leant back in our chairs to watch the comedy, until the *soi* was handed round, a liquor made from a Japan bean at present much used by the wine drinkers of Europe, to revive their faded palates. Various kinds of shell and fresh fish followed, succeeded by several thin broths, and concluded by the costly though insipid birds'-nest soup. The table being cleared, a very pretty specimen of the Yuen-ming-yuen porcelain was placed before the host. It consisted of a series of nine dishes (corresponding to the number seated at the board) shaped like a cabbage, and all fitting into one another. The contents were a variety of scorched seeds and nuts, which were nibbled, along with sundry hot wines and tea, amidst a cloud of tobacco smoke, the host considerately procrastinating his usual opium-pipe till a later period.

But the shades of evening warned us not to forget that, however great the hospitality, we were in the midst of a population eminently hostile to foreigners. Bidding adieu, therefore, to San-ko-lin-Sin and his friends, and surrounded by our military guard, each individual soldier of whom looked as if he would like to terminate our career and decorticate our remains, we fortunately reached our boat in safety, and presently landed at Hankow.

WILLIAM COCHRAN.

PUBLIC HEALTH.

Part VI.—VITAL STATISTICS (Continued).

There are parts of England and Wales where registered medical men are rare; people are at the mercy of quacks; and from this and other causes, certified deaths are the exception. At St. David's, for instance, Dr. Hunter found but 15 certified out of 500 registered deaths.* The returns from these districts (now happily few in number) can scarcely be of much value. Then again, as Mr. Simon remarks, the certificates often tell "cock and bull stories" about the cause of death. In spite of the admirable lists of disease compiled by Dr. Farr, which have lately reached their full development in the nomenclature of diseases drawn up by a joint committee appointed by the Royal College of Physicians of London, medical men are too often lax in their use of terms, or careless in the identification of disease. In some parts of Wales, for instance, Dr. Hunter found that consumption did not necessarily mean a chest complaint, but something analogous to decay.† The returns of death from epidemic disease, such as small-pox, measles, or scarlatina, may be accepted as near the truth; but what can we think of cancer, of insanity, of epilepsy, of delirium tremens, or some other diseases to which a stigma is attached, when we know the repugnance of friends to divulge the dark secret of a household, or the deadly heritage of a race?

The columns then of the returns relating to causes of death will vary much in value and significance. Some, as those devoted to the epidemics, will tell us of the occurrence and fatal effects of those diseases;‡ others will inform us of lurking danger. "The local conditions," says Mr. Simon, in 1858, "which favour epidemic visitations, are conditions which, for the most part, it takes time to create, and which it always takes time to remove. The death-rates of certain ordinary diseases measure these local conditions, and predict where are the sure places for epidemic mortality to fall." Others again point to places, and even buildings, which are destructive to human life. The paper of Dr. Headlam Greenhow

* 7th Report of Medical Officer of Privy Council.

† 7th Report of Medical Officer of Privy Council.

‡ Dr. Guy, in his lectures on Public Health, p. 41, brings the rise and fall of the death rate from certain diseases to bear most ingeniously on the solution of some difficult questions of causation. This charming little work (reviewed in the present number) should be in the hands of every one interested in sanitary matters.

already alluded to, the classical letters of Dr. Farr, which accompany the reports of the Registrar-General,* and the numerous reports by the medical inspectors of the Privy Council, to be noticed more fully hereafter, are proofs, if proof were wanted, of the important results which we have derived from generalisations on the causes of death—or, to speak more correctly, of the causes which led to death; for, in analysing the returns, more stress is usually laid on the penultimate than on the ultimate cause of the fatal result. The form of certificate used in England requires not only the immediate cause of death, but the disease which led to it; for instance, the certificate might stand thus:—First cause, measles, 19 days (from commencement to death); second, or immediate cause, inflammation of the lungs, three days, where the former would be the important item in the entry; where two diseases are given, such as "diseased liver and kidneys," or "scarlatina and measles," the analysis must present some difficulty; and it is not easy to see the reasons which induce the Registrar-General to select the first and not the last-named of two epidemic diseases as the actual cause of death.†

Up to the close of 1869, the annual report of the Registrar-General, coming at least a year after date, was, if we except the scant notices of registrars in the quarterly returns, our one source of information respecting the causes of death; but we are now promised quarterly returns of the deaths in sub-districts, and in 17 large towns in England, from nine special causes, viz., small-pox, measles, scarlet fever, diphtheria, whooping cough, fever, diarrhœa, cholera, and violence; and the first Report, containing these particulars to the end of March, was issued on the 5th of May in the present year. At first sight the quicker return would appear to bring with it certain advantages; but it may be doubted whether these are not outweighed by the defects which are rendered apparent on a close inspection of the figures. Without pausing to consider whether a report, five weeks at least after date, can be utilised for the check of epidemic disease, or for other sanitary purposes, it may be noticed that the Registrar-General has in this instance been compelled to seek assistance beyond the central office. The great principle of local analysis and classification of local death-rolls, has

* Especially Reports for 1851, 1852, 1856 and 1857.

† "Where two of the eight (diseases) are entered in column 6 (of the Registrar's book), for instance, 'scarlatina, diptheria,' or 'whooping cough, measles,' it will be right to enter the death under the first of the two mentioned."—Instructions for guidance of Registrars in filling up the Quarterly Returns of Births and Deaths.

been conceded, but without that natural safeguard of skilled supervision which Dr. Farr, with admirable forethought, had suggested and urged upon his chief. The result is a "provisional" return, full of errors, which, in mischievous hands, may do incalculable injury to places and persons before they meet with final correction in the annual report. Can nothing further be done to give local boards and individuals interested in sanitary matters such quick and trustworthy information as shall assist them in dealing with the first causes of invading disease? A final classification of returns for the kingdom in a central office is, of course, essential for purposes of state, to afford data for sanitary laws, for the solution of great questions in sanitary science, for the formation of life tables, etc.; but the Registrar-General allows that Somerset House would be unequal to the pressure of immediate returns for the whole country; for these we must look to local action, and that of a competent kind. The Registrars are zealous in the performance of their duties; but, from want of special education, are generally incompetent, except as copyists, to deal with medical terms. No confidence can be placed in their analysis and classification, unless checked and corrected by some one versed in medical nosology.

In the absence of a district registration officer, the superintendent registrar at least should be a medical man; he should have power, when necessary, to ask for explanation of a careless or imperfect death certificate, and he should satisfy himself that there was nothing wrong in cases of uncertificated deaths. The returns should come to him daily or weekly for analysis, and the results be made accessible each week to the sanitary authorities, and every registered practitioner in the district. Much might be effected in this way; but if it is really wished to stamp out disease on its first appearance, not only the deaths, but the fresh cases of certain classes of disease must be ascertained and dealt with at once and on the spot. "Local authorities," says Mr. Simon,* "and most of all when large populations are concerned, are imperatively bound to keep themselves properly advised by skilled officers as to the special causes of disease operating within their respective jurisdictions." The examples of Manchester, Liverpool, and Newcastle, suffice to prove what may be effected by quick returns of disease from Poor Law officers and public bodies. At Manchester and at Newcastle the expense and trouble are borne by a medical society, the returns being voluntary. The locality, nature, prevalence, fatality, and type of an epidemic, are known at once, and to be forewarned of danger

* Report to the General Board of Health by their Medical Officer, 1858.

is to be forearmed against it. A national *registration of disease* occurring in Poor-Law practice and public institutions is one of the sanitary wants of England. No death-rate can supply its place, and much harm has sometimes been done by the attempt to convert a mortuary register into a record of disease. As a test of health, the sick-rate stands far above the death-rate, for it introduces us to sources of evil unknown to the bills of mortality—to maladies which do not kill, but which slowly and surely sap the life blood of our working populations.*

A summary of the cases attended by the medical officers of a union, especially if collated and compared at frequent intervals with returns from hospitals, sick clubs, and other public or quasi-public institutions, could not fail to afford the most valuable and trustworthy information. Plague spots, little known even to the inspectors of nuisances in our country towns, would be pointed out and convicted on the surest evidence. Epidemics would be met at their very onset; the circumstances, course, and fatality, perhaps even the causation, of many enervating diseases, would be ascertained with a precision now unknown.

The Registrar-General, it is true, ridicules the idea of a national registration of disease, and declares himself unequal to the task of recording "all the complaints which do not kill, but only annoy and afflict, the 22,000,000 inhabitants of England and Wales;" and certainly a classification in a central office of minute ailments, such as the Registrar-General paints in his liveliest colours, would be as absurd as it is impossible. But there could be little difficulty and little expense attending a well organised return for sub-districts or portions of sub-districts of certain well defined and (as health-tests) important types of disease. The voluntary efforts of individuals have paved the way, and difficulties have disappeared before the warmth of energy and willing work. We may, therefore, feel inclined to agree with the Registrar-General in one part of his "Remarks submitted to the consideration of the Royal Sanitary Commission,"† that "if it be decided that Parliament should be invited to enact that record should be made of cases of diseases not proving fatal, and of still-born children, that inquiry would be best conducted under the able superintendence of the medical officer of health attached to the Lords of the Privy Council."

E. T. Wilson, M.B.

[TO BE CONTINUED.]

* See Mr. James Lewis's admirable paper on "National Returns of Sickness," read before the Social Science Association, March 24th, 1870.

† Appendix C to 31st Report of Registrar-General.

POPULAR FOOD ANALYSIS.

No. 6.—CONFECTIONERY—(Continued).

Having thus glanced at the principal classes of coloured sweets in their turn, we must now take a short survey of the uncoloured. These were twenty-three in number, and consisted of sugar mingled with gum, starch, and sulphate of lime, and flavoured with various essences. There was nothing actually poisonous found in any of them, but in some the proportion of lime was very large. In his evidence before the Parliamentary committee on adulteration, Mr. Gay gave the process for making such comfits as follows:—"I think carraway comfits are extensively adulterated, and also many of the peppermint lozenges. I believe the bases of both these, coriander and almond comfits, are flour and terra alba; after the seeds are put into the pan, a little syrup is thrown over them, and that is dusted over with either flour, whiting, or plaster of Paris; a strong coat is put upon them in this way, and then they are finished with a stronger and better syrup." Our own analyses of the white samples, which want of space compels us to omit, bears out these statements to a great extent, and shows that we are no better served now, by the confectioners, than we were then.

Another important matter which was brought before the committee was the flavouring by artificial essences. This art was, at that time, comparatively in its infancy; but the rapid strides with which the chemistry of the various hydro-carbons and their derivatives has advanced, has made it possible to imitate almost any fruit flavouring. The artificial essences are for the most part ethereal salts, or, more popularly, compounds of an ether with some organic acid such as vinegar. As these compounds can be obtained in much greater quantity and at a much lower price than real fruit essences, their use by the confectioner has now become universal. We are not aware that any real researches have been made as to the exact physiological action of these compound ethers, but we have seen it asserted that sweetmeats so flavoured can produce drowsiness and stupor. We trust, however, to present our readers, at no very distant date, with the results of a careful series of experiments on animals, now being conducted in our laboratory. But besides the innate

danger which must exist in these substances when too freely employed, there is superadded the peril of careless manufacture. The essence of bitter almonds is a good instance of this, as it almost invariably contains a large quantity of prussic acid; and so well is this known, that many persons desirous of commiting suicide or murder, and not being able to procure the pure acid, have availed themselves of the poisonous qualities of this essence, to effect their deadly intentions. It is of course seldom that a sufficient quantity of the essence is employed to produce death from eating almond flavoured sweets; but when we consider the activity of the poison, and the consequences which might follow careless and insufficient mixing, we see the risk which we daily run in the use of this flavouring. Among our samples there was one case in point. The sweets in question were shaped like large sugared almonds, but destitute of the usual interior, although the odour and taste were most powerful. They were found to be masses of sugar and sulphate of lime, slightly tinged on the surface with chrome yellow and red lead and very highly flavoured with essence of bitter almonds. On dissolving and submitting them to distillation and the usual tests, such a decided trace of prussic acid was found, that there was nobody in the laboratory bold enough to try the effect of eating a dozen or two, for the sake of experimenting on their poisonous powers. We suspect this was a case of the essence not having been properly distributed through the whole pan of sweets.

And now what do our readers say to the picture presented in the last and present papers? It has been in no way varnished up, nor has any attempt been made at sensation, as our collectors were boys sent out to buy what sweets they liked best, by which means we thought the confectionery most in demand by children would be procured. In previous articles we have shown up admixtures which amounted to nothing more than petty frauds on our pockets, but all these sink into obscurity, when placed side by side with the wholesale adulterations practised on our infants. We have many strong-minded ladies now, who take a high interest in social affairs, and to them we commend this subject. It is one which would at once be graceful, and more suited to their status in society, than some other matters which have lately engaged their attention. Who is a more natural protector of her children than a mother? unless, indeed, like Mrs. Jellaby, she is too strong-minded and literary to attend to them. But we hope there are, after all, few Mrs. Jellaby's in the country; and we therefore appeal with confidence to the ladies of Britain, to use their influence with the lords of creation, so that a bill may be passed to prevent their little ones

being daily tempted to purchase and eat chromate of lead, vermilion, Brunswick green, and prussic acid. It may be argued that the minute quantity employed renders the poisons comparatively harmless; but let us remember the small and delicate little organisms into which the bulk of the sweetstuff in England is intended to pass, as well as the fact that lead arsenic and most of the pigments used are cumulative poisons, which do not leave the system, but go on collecting force, as it were, for their fatal work from each replenishment. With the influence of the ladies and mothers of England on our side, one of the great objects of the "Food Journal" cannot thus fail to be accomplished.

No. 7.—CHEAP AËRATED BEVERAGES.

At this season of the year, when every general shop in the metropolis exhibits at its door a table covered with little stone bottles, and decorated with the announcement, "Celebrated ginger beer, *1d.* per bottle," it has seemed advisable that we should see what the "celebrated" drink really contains. We were the more inclined to this by receiving the other day some curious hints, under the following circumstances. Always anxious to be up to all the tricks of our great city, we some time ago replied to an advertisement offering to teach a lucrative trade, for a consideration in postage stamps. In reply to our note, we received from Mr. Do'em Brown a set of printed instructions for entering the profitable and elegant business of a manufacturer and retailer of summer drinks; and certainly, if we had followed the receipts, we could have sold at a good profit what would have been, to put it in its mildest form, quite a shilling's worth of dyspepsia for a penny. The question, therefore, naturally arose in our minds, whether the public is served with deleterious liquor under the sheep's-clothing of aërated drink, and whether teetotallers float from the Scylla of alcohol, gently and comfortably into the Charybdis of lead and large daily doses of cream of tartar?

The use of aërated beverages is no new thing, as we find that it originated in the efforts of one Thurniesser (A.D. 1560), to imitate the natural effervescing springs of Germany. Many other inventors followed on the same track, but without anything like success until 1750, when Venel suggested the use of a mixture of a solution of carbonate of soda with muriatic acid, the ingredients being brought together in a closed vessel. This was a step in the right direction, but it was reserved for our own countryman, Dr. Priestley, to demon-

strate that carbonic acid gas could be made to dissolve in water by pressure, and would come off again with effervescence when the cause of solution was removed. This, coupled with the researches of Bergmann, by which he proved that seltzer water really contained carbonic acid in solution, led to the establishment of the first manufactory of aërated water at Stettin in 1787. The trade was soon afterwards commenced in Paris by M. Paul, who introduced the principle of generating the gas separately, and pumping it into the water; and we find that its popularity soon became established.

The proper mode of making aërated water is as follows:—The carbonic acid gas is generated by the action of sulphuric acid upon chalk. It is then passed into a gasometer exactly like those employed in our gasworks, only, of course, much less in size. From this gasometer, it is pumped into the condenser, along with the proper quantity of water. In the condenser works an appliance called the agitator, which assists in mixing the gas and water, thus hastening solution by exposing a larger surface of the latter to the action of the former. The pumping is continued till the gauge, with which the condenser is fitted, shows that the requisite pressure has been attained, and then the aërated water is ready for bottling. It has, however, as yet no flavour, and this has to be produced by putting a small quantity of lemon or ginger syrup into the bottles before running in the water from the condenser, or, in the case of soda water, by introducing a few grains (generally 15 to 20) of carbonate of soda in the same manner. Even when thus honestly prepared, the resulting beverage is apt to be bad, owing to defects in the machinery; and we will now notice the two most common contaminations and their causes.

1.—Aërated water may be contaminated by *lead and copper*. This most dangerous effect may be caused in various ways. 1. The plunger of the forcing pump may be copper, instead of silver or glass, which it always ought to be. 2. The condenser may be simply soldered up, instead of rivetted. 3. The agitator may be made to work on a pivot *inside* the condenser, instead of passing through it. In this way the agitator always works in metal instead of leather, and it does this *just where it is exposed to the highly solvent action of water charged with carbonic acid gas.*

2.—Aërated waters are liable to be tainted with *sulphuric acid.* This occurs where the gas is passed direct from the generator into the condenser without purification. When the gas is formed, a certain quantity of sulphuric acid vapour always rises with it, and if this be not removed, it of course passes into and contaminates the water in the condenser.

With this short introduction, we now propose to give the results of our examination of the cheap aërated drinks.

1. *Lemonade.*—This article is, we find, sometimes but very rarely, sold at *1d.*, although usually at *2d.* per bottle. Each bottle should contain half a pint of aërated water, flavoured by means of a syrup made by dissolving sugar in diluted juice of lemons. A good and pure lemonade should show on analysis nothing but sugar and citric acid, and should have a pressure in bottle of at least 60 lbs. to the square inch. Six samples were tested with the following results :—

No.	Contents of bottles.	Citric Acid.	Sugar Per Bottle.	Tartaric Acid. Per Bottle.	Sulphuric Acid.	Copper or Lead.
1.	9 oz.	None.	Nearly 1 oz.	9·21 grs.	None.	None.
2.	½ pint.	,,	About ½ oz.	20·46 ,,	,,	,,
3.	8½ oz.	,,	,, ,,	17·50 ,,	,,	Trace.
4.	8½ ,,	,,	,, ¾ oz.	17·50 ,,	,,	,,
5.	½ pint.	A little.	,, ,,	40·00 ,,	,,	Large trace.
6.	,,	None.	,, ,,	20·60 ,,	,,	Trace.

Thus we see that in the cheap lemonade there is rarely a trace of lemon-juice at all, the syrup being compounded of sugar, tartaric acid, and essence of lemons. In four cases out of six, poisonous metallic contamination was abundantly evident. The aëration was very imperfect, except in the case of No. 4, but even in that sample it fell far short of the proper amount. The lemonades were all more or less turbid, and, under the microscope, revealed myriads of organised germs and cells with a bright nucleus.

2. *Ginger Beer.*—This article is commonly sold at *1d.* per bottle. Pure and good ginger beer should be made by boiling an ounce of ginger and a pound of sugar in a gallon of water for some time; then straining off, adding a little yeast, and leaving the whole to ferment for twenty-four hours before bottling. During the fermentation, and subsequently in the bottle, the sugar is partly changed into alcohol and carbonic acid gas, which latter, being confined, causes a pressure to take place, under the influence of which it dissolves in the water, and is liberated with powerful effervescence when the cork is drawn. Real ginger beer is, therefore, not truly a teetotal drink; as, when good and well "up," it always contains a minute proportion of alcohol. In the common ginger beer, we find that the rule is to reduce the sugar and the ginger to the minimum possible quantity, adding cream of tartar and capsicum to contribute the sharpness and pungency so in vogue with the drinkers of the article. The beer is also commonly contaminated with iron, we presume from the boilers in which it is

made. Six samples of this beverage were also tested, with the following results :—

No.	Contents of Bottle.	Acetic Acid. Per Bottle.	Cream of Tartar. Per Bottle.	Total solids.	Metals.
1.	½ pint.	2·63 grs.	2·0 grs.	187·6 grs.	Iron.
2.	„	7·75 „	3·60 „	137·1 „	„
3.	„	11·00 „	4·00 „	226·0 „	Copper.
4.	„	9·60 „	4·00 „	172·5 „	None.
5.	„	2·30 „	3·50 „	244·5 „	„
6.	„	5·60 „	2·30 „	205·4 „	„

This table shows that in all the beers acetic acid had been formed, and some, such as 3 and 4, were very bad in this respect. These same numbers are also to be distinguished by an extra dose of cream of tartar, while No. 3 was found to contain copper, presumably from the vessels used in manufacture. One bottle smelt so strongly of petroleum that its contents were undrinkable.

Having thus seen what our cheap summer beverages are, let us consider what would be their effect on consumers. It is plain that in each bottle of lemonade we take a dose of tartaric acid, averaging about twenty grains, and that the chances are two to one that we also absorb a notable proportion of copper. In each bottle of ginger beer, on the other hand, we take about 3½ grains of cream of tartar, and a variable amount of acetic acid, besides running the risk of metallic contamination. The properties of tartaric acid and cream of tartar are diuretic and purgative when taken in large doses, and when often repeated in small doses they tend to upset the whole digestive organs. On this point Dr. Pereira says in his *Materia Medica* :—"By continued use, it (cream of tartar) disorders the digestive functions and causes emaciation, most probably from defective nutrition." He makes a similar remark as to tartaric acid, viz. :—"Its continued use very readily disturbs the digestive organs." But, besides their intrinsic indigestibility, cheap aërated waters expose their drinkers to the dangers of carelessness in manufacture. The contaminations resulting from imperfect machinery have been already shown, but the risk daily run from careless washing of the returned bottles, is no unimportant consideration. The case of poisoning through lucifer matches in a badly washed bottle, will still be fresh in the memories of most of our readers; and the instance of the bottle smelling of petroleum which we had, is a proof that no more caution is used now than then. We will willingly admit that much cannot be expected for a penny or twopence, but we are surely entitled to demand that the cream of tartar, tartaric acid, and copper, should be left out of the programme. The whole system of cheap drinks wants

revision in this country, for those now in use are certainly crude in the extreme. We envy the Parisians, with their neat and clean syphons of the simple aërated water, which can at once be turned into any drink by letting it run on to a spoonful of pleasant fruit syrup, previously placed in a glass. Even were it honestly made, our ginger beer is not a wholesome thing; because in drinking it we consume a half-fermented liquor, in which the acetous fermentation has generally freely developed itself. What man who has ever felt the pangs of dyspepsia could wish a fellow creature a worse fate than to be condemned to the consumption of a few bottles of No. 3, which contains:—1. Enough acetic acid to make a tablespoonful of common vinegar. 2. Four grains of cream of tartar. 3. A trace of copper; and the whole imprisoned in a bottle smelling of paraffin!

J. Muter, Ph.D.

According to the Scottish Registrar-General's Report, the health of the community in Scotland was not good during 1869. The deaths (75,789) reached the highest number ever registered in that kingdom, and amounted to 2·364 of the population,—a ratio not equalled for five years. The rapidity of life in densely inhabited districts is shown very strikingly—the deaths in the rural towns being only 1·75 per cent., while in towns with over 25,000 population, they were 3·25. Two singular facts appear in connection with this report—1, that Edinburgh and Aberdeen furnish double the proportion of deaths by cancer over every other town; 2, that deaths by accident almost always rise and fall with deaths from disease.

We take a few notes on the dietary of the Agmara Indians, from a paper read before the Ethnological Society by Mr. Forbes, who resided some years in their country. These Indians, the inhabitants of the shores of Lake Titicaca and the lofty plateau of the Andes, find the struggle for existence hard, at an altitude of 11,000 to 14,000 ft. above the sea. They have to depend chiefly upon quinoa, a coarse rice-like grain, and potatoes, of which root their country is the original habitat. The difficulty of boiling food at so great an altitude necessitates the previous maceration of all articles intended to be thus cooked. The potato is, therefore, prepared for storing and use thus:—The roots when dug are exposed to the frosts; when frozen through they are placed in water, and stamped into a paste; all the soluble matter is washed out, and the starchy and farinaceous substance only remains, which is preserved under the name of "chuno;" and, when wanted, made into a sort of soup, which is nutritious, though insipid. The Indians use clay as an article of food, mixing it with the quinoa. Specimens bought in the market of La Pay were exhibited. It is a common whitish clay, rather gritty, but has been shown, by careful analysis, to be destitute of any organic matter which might afford nutriment, and can only be used to eke out the scanty supply of food, and produce a satisfactory, though delusive, distension of the stomach.

POULTRY FEEDING IN FRANCE.

We have spoken previously of the large supply and excellent quality of French poultry, in order to show how valuable an article of food it supplies to our neighbours. We are now enabled to relate, from an official report, in what manner, at what cost, and with what profit poultry is fattened in France.

M. Martin, who resides near the town of Cusset, is the inventor of a peculiar method of management of poultry, and has attracted so much attention to his system, that the Agricultural Society of Allier appointed a commission to visit and report upon his establishment.

The feeding house is a large rotunda, situated in the midst of a park of ten acres in extent, and on the summit of a tolerably elevated hill. In it are three octagonal stands which turn on a vertical axis; each side of the stand has five perches, and each perch receives five birds, or 200 in all. The fowls are divided off from each other by means of small slabs of wood placed vertically on the perch, and are secured to the latter by means of strips of hide around the feet, leaving their heads and wings at full liberty. The feeding is effected in the following manner:—The operator has a small seat, which he can shift upwards and downwards in order to reach the various cages; he takes the head of the fowl opposite to him in his left hand, and with his right places in its gullet a small tin nozzle, which is attached to a flexible tube communicating with a reservoir containing the food, so that a touch of the foot on a treadle projects the desired quantity into the fowl's stomach. A graduated dial, with a hand in connection with a piston, serves to regulate the amount of food according to the age and kind of bird, and the degree to which it has been fattened. The feeding is performed with great rapidity, an hour being sufficient for 200 birds, or one frame, and the fowls seem to enjoy it, looking sharply after any stray drops of food that may have fallen within their reach. This food consists of barley and maize meal mixed with lard, and reduced with milk to almost a liquid state. The fowls are kept scrupulously clean, the droppings falling on sloping boards behind the perches, and thence towards the centre; every morning cut straw is thrown upon it, and the whole is swept into a hole near the centre, where it is received in an iron barrow running in a channel beneath the frame. When the fowls are ready for market, they are placed in a dark but well ventilated apartment, and left without food for 24 hours; they are then suspended by the feet, a cloth is passed

round them to prevent movement, and a small instrument is introduced into the throat so adroitly that they are killed instantaneously. They are then plucked, washed, drawn, wrapped up in wet cloths to cause them to cool rapidly, and placed on stages that the blood may escape freely. From 30 to 40 are sent to market daily.

The reports speak highly of all the arrangements made by M. Martin, which are the results of many trials, and especially those for the radical destruction of the mites which infest all fowl-houses. M. Martin patented his system in 1867. The fowls fattened under this system have obtained for M. Martin several medals, and the Commission is of opinion that they are amongst the finest sent to market. As regards the economy of the system, the report takes for basis the cost per day of fattening 600 pullets, aged from three to four months; those to which it has been principally applied. The duration of the fattening is 18 days, and one man and woman do the whole work, so that the great economy of the plan is easily demonstrated. In feeding by hand, one person cannot cram more than 20 birds an hour, or 30 at most with the use of a funnel, while under the new system 200 are fed in an hour. The bill of costs for one day is thus set forth :—

		f.	c.
Purchase of 33 lean pullets, at an average cost of 2fr. each		66	0
Food for 600	60 kilogrammes of meal, at 25c.	15	0
	30 litres of milk, at 15c.	4	50
	2 kilogrammes of lard, 1fr. 60c.	3	20
Wages of a man and woman		3	50
Loss at the rate of 3 pullets per 100		2	0
Interest on cost of material valued at 2,000fr.		0	40
Rent of building at 360fr. per annum		1	0
Paid for plucking, etc., 5c. per head		1	65
Sundry expenses		3	0
Total .. .. say	£4 0 0	100	25

This brings the cost of a fattened pullet to a trifle over 2*s.* 5*d.*, or 50 per cent. more than the price paid for it originally. But there are certain deductions to be made from the expenses incurred—sale of feathers, manure, blood, and offal, which diminish the cost of a fat pullet to little more than 2*s.* 3*d.* To form, however, an exact estimate of the cost, it is necessary to take weight into account. The ordinary pullet of Allier at the age stated weighs 950 grammes (nearly $2\frac{1}{10}$ lb. avoirdupois), and, when fattened, plucked, and ready for market, 1,123 grammes. This brings the cost to 2fr. 53c. per kilogramme, or 11*d.* per pound. M. Martin sells his fat pullets at 3fr. 50c. Better results still are said to be obtained with the breeds peculiarly adapted to fattening, such as that of La Bresse; pullets

of this race weighing 2¼ lbs., and doubling in their weight during the fattening. The plan is applicable to other poultry besides pullets. Last winter capons, ducks, and turkeys were fattened by the same means with success.

The Commission expresses its surprise at the results achieved, especially considering that M. Martin has inaugurated his system in a part of the country where no progress has been made in the rearing of poultry, and where the breed of fowls is not the best adapted for fattening, and it believes that the plan may be made the starting point of a radical improvement in the rearing of poultry, which hitherto has been little appreciated, except in certain districts. France exports annually eggs to the amount of 18,000,000 francs (720,000*l.*), and only imports one-sixth of that amount, which proves that the climate is well adapted for poultry. If establishments like M. Martin's were set up in every department of France, and every district of England, they would become perfect manufactories of poultry, for the farmers would then always have a market for their chickens, as fattened poultry always finds ready purchasers. Moreover the produce in manure would not be unimportant, for each pullet fattened by M. Martin gives on an average 2½ lbs. of dry manure, said to be equal to the best guano of Peru. Another great point is the health of the breeders as well as of the fowls. Poultry fattened by hand is generally kept in narrow cages, often in barrels, without a proper supply of pure air; and in the midst of all the filth, the persons who feed them tie three of the unfortunate birds together by the legs, and then cram them alternately with 15 or 20 balls of food in spite of their violent struggles; and it is surprising how the feeders themselves live in the vitiated air around them.

In M. Martin's system the fowls are always surrounded by pure air, everything is kept scrupulously clean, washed and disinfected by means of sulphate of iron; the birds suffer in no way from the mode of feeding, and are almost invariably healthy, and the feeders have but little to do. It has been proposed to set up a model feeding establishment in the gardens of the Acclimatisation Society in the Bois de Boulogne.

There is little doubt that many supplies of food are capable of great extension, and that poultry, whether reared naturally with the aid of houses on wheels, as described in the May number of this Journal, or on Martin's system, offers to farmers and others a fair prospect of remunerative occupation. Perhaps in time we may see realised the hope of Henri of Navarre, that every peasant should have a fowl for dinner on Sundays.

G. W. Yapp.

LONDON DINNERS.

Part V.

Among the few ancient houses in Fleet Street, which time and change have spared, is the "Rainbow," the second coffee-house opened in London. The halfpenny tokens issued by John Farro, in 1666, bearing a rainbow based on clouds, recording emblematically the escape of the house from the Great Fire, are still preserved in the Beaufoy collection. That the house did a thriving trade was attested by the jealousy of the neighbours, which caused the proprietor to be indicted, in 1657, by the inquest of St. Dunstan's, "for annoying his neighbours by evil smells, and for keeping of fire for the most part night and day, whereby his chimney and chamber hath been set on fire." We do not doubt that the fire still burns as constantly, though without the same ill effects, and the smells are no longer evil. The old interior has been altogether remodelled; and, in the richly decorated dining-room, with its Renaissance ornamentation, and its tables well furnished with snowy napery and brilliant equipage, the old customers, could they revisit it, would not recognise their familiar haunt, with its lofty bay-window at the south end, looking into the Temple, where the elders had their especial table, and the glazed partition which screened off the adjoining kitchen.

This is a thoroughly comfortable dining-room, dark though it be. Dinner from the joint is served at 2*s*., an additional 6*d*. adding soup or fish of the less luxurious species. The carte presents the usual choice of entrées. We would point out the desirability of having a "bill of fare" on every table, for choosing the component parts of dinner sometimes requires meditation; and, although the obliging head waiter is sure to be called into council, yet a sense of haste is imparted by the momentous choice having to be made from a carte presented while he waits, and other guests demand his presence. The quality of the various comestibles is right good. Real Cheddar cheese replaces the dubious "Cheshire" generally found. The proprietor deserves praise for being content to charge the ordinary 4*d*. for a pint of "malt," instead of mulcting his guests 6*d*., as is the practice at other houses; and we take this opportunity to reprehend an unwarrantable overcharge, for which no sufficient reason can be given. We consider it an imposition,

only fit for the proverbial greed of the lessees of railway refreshment rooms, that the ordinary "bitter" should be retailed at 4*s.* per gallon instead of 2*s.* 8*d.* As might be looked for in a house under the wing of the Temple, the wines at the Rainbow are commendable, and the prices in the wine list are fairly and judiciously assorted.

A lower tariff of charges is advertised by Anderton's Hotel, on the north side of Fleet Street. As at Carr's, dinner from the joint is offered at 1*s.* 6*d.* This house is well known to Brethren of the Craft, and has a considerable reputation; and we are sorry to have to speak somewhat disparagingly of it. The carte shows a regard to economy, though, like others, absurdly high prices are maintained, without sufficient regard to market rates, for certain dishes, as salmon, ducklings, etc. The dining-room is deficient in ventilation, and very little regard is paid to appearances. It did not need a fastidious eye to perceive the uncleanliness of the table-cloths, which had done unmistakeable two days' duty; and the general appearance of the waiters was in full but unpleasant keeping therewith; and, as our experience has always found, the attendance was as slovenly as the garb of those who rendered it. We found the meat served of good quality, and well cooked; and though, as a general rule, we object to carving for ourselves, it was preferable in this instance. The vegetables were inferior; our experience of the wine was confined to what was called sparkling hock, of which two sorts figured in the wine carte, but only one was forthcoming—"they had no other;" and it was simply noxious. As a summary, the remark of one of our party was painfully true, that he did not feel benevolent, and had no satisfaction in paying for his dinner, which is a severe comment on the general effect.

One hardly expects to find a genuine French café restaurant east of Temple Bar; but, nevertheless, not far from the "Food Journal" office, there lurks, in Castle Street, a modest little house, which is a typical one of the species; the window, full of wine bottles of all shapes and sizes, and a modest announcement of "café restaurant" scarcely attract the uninitiated, although the savoury odours issuing forth may arrest the hungry passenger. The little room is quiet and cosy, and the snowy whiteness of the table linen, and brightness of the equipage, might well shame many of our English houses. The *dame du comptoir* presided at the little bar, and chatted to the known guests. She was sorely discomposed at extracts being made from the carte, and seemed to suspect that we were borrowing culinary ideas for an opposition establishment. The said carte offered for choice, in French and English editions, six soups at 4*d.* and 6*d.*, including "Victoria porridge," sole and

salmon, entrées, etc., and roti, which we did not try. The prices affixed to all are moderate. We made a tolerably good dinner on salmon à la crême au gratin, and filet de bœuf au beurre d'anchois, with excellent Gruyère, and a half bottle of Beaune (not equal to Carr's), and paid unreluctantly 3*s.* 9*d.* The meat was not first rate, but the cookery was far better than that of the "Globe" or "Solferino." A curiously high estimate of the value of "legumes" seemed to prevail, new potatoes in July figuring at 4*d.* The etiquette of the little café forbade the beloved meerschaum, though cigars were tolerated,—a curious relic of manners and customs, which was amusing though inconvenient. We lost ourselves in vain speculations as to the class of customers who patronise this restaurant, but by no means regretted the curiosity which had brought us thither.

We leave uncriticised Dick's, with its abundant luncheons, and the well remembered untidy "Cheshire Cheese," famous for steak puddings, and proceed into the city. Cheapside alone bewilders by the number of dining and luncheon rooms which abound on both sides of the way. The best of the latter is the new and handsome establishment opened by the enterprising owner of the "London," Mr. Sawyer, who caters well for his numerous customers at "Pimm's." We must say that we object to the necessity of standing to consume our lunch as if it were a passover meal; but the quality of the viands and the reasonableness of the prices at this establishment are amply attested by the numbers that crowd the well supplied counters.

Lake's is a name of old renown, and the "Anchor" rooms are daily thronged. The waiter informed us that 500 was the lowest, and 1,000 the occasional number of guests fed therein daily between twelve and six o'clock. The general rule is of course early dinner; and 7 p.m. is the latest hour at which even Crosby Hall opens its portals. The "Anchor" closes at six. We went late in the afternoon. But though this might be esteemed an excuse for want of variety, we did not consider it a valid reason for the defects we found to exist. The charges are per dish, and the tariff on the usual scale. The prices are not high to the imagination; but when the quantity of meat and vegetables supplied is considered, the scale will be practically found one of exceeding dearness. The diminutive ration of lamb served up, the three smallish potatoes, and scanty dish of peas resembling swan shot, followed by cheese called Cheshire, but of the most ordinary nondescript quality, formed an apology for dinner, which, in our opinion, was not worthy of the reputation of the place, and thoroughly dissatisfied us. The dining-room

is well appointed, and is admirably well ventilated, and should have been the scene of a worthier meal; and the civility of the waiter was unimpeachable. By the way, we would beg to recommend the removal from the tables of the common dish of mint sauce, as we observed that its presence was too great a temptation to one of our neighbours, who refreshed himself by occasional sips therefrom, apparently considering it to be a species of mint julep, placed for the common refreshment,—very nice for succeeding diners! It will doubtless be declared that our experience was exceptional. As far as we are concerned it certainly will continue to be so; and we congratulate the frequenters of the "Anchor" on the contented minds that they must bring with them.

Another "Lake's," in Gracechurch Street, belonging to the energetic proprietor who has made Crosby Hall what it is, furnished us with a very satisfactory contrast, both as regards the quality and quantity of the food supplied at the same rates; and the crowded rooms on both floors seemed to express the verdict of the public as agreeing with our approval. Here the ladies have a special room provided for them on the second floor.

The "Guildhall" Dining-rooms, in Gresham Street, include a standing luncheon bar, which is tolerably well supplied at moderate prices, and a dining-room where dinners from the joint (inclusive as usual) are served up to 7 p.m. The price (apparently copied from Simpson's) is 2*s.* 3*d.*; but let not the visitor suppose he will be reminded, except in a negative and regretful manner, of Simpson's fare. A friend communicated his experience and his bill: lamb (or rather young mutton), potatoes, peas, cream cheese, and pint of bitter—3*s.* 6*d.* We ourselves dined at 4 p.m., and the only choice was roast beef; and very inferior meat, both in quality and cookery, it was. We made a note that both meat and vegetables were the worst we had found in the city; but the waiter apologised for both, on the ground of a "run on the resources of the establishment," owing to the sitting of the courts. The general tariff is too high—a plain fish dinner, meaning soles and eels, is charged 2*s.*; and in view of the Crosby throne-room dinner at 1*s.* 9d., it is a mystery how, save under the pressure of attendance at court, customers can be induced to pay so high a charge as 2*s.* 3*d.* for the joint, etc. The price is, we presume, imposed as a compensation for the loss in the dead season, but we protest against the name of "Guildhall," so suggestive of excellent "feeds," being associated with the bad dinner furnished to us, for which we paid 2*s.* 11*d.*, which was above the price paid at the "Rainbow."

In the remnant of Bucklersbury that the earthquake wave of improvement has spared, there are three eating-houses; we use the word advisedly. For fifty years has Gibson's fed successive generations of clerks, and the venerable looking owner still presides in the old-fashioned place. The deep tone of the well coloured walls, and the semi-carpeted floors of the room,—which consists of two apartments of different floor levels thrown into one, with a bar and sort of scullery partitioned off at the end,—all bear their silent witness to the truthfulness of the waiter's boast, that this is "the oldest house in the city;" but we should like to have seen the napery whiter and the covers brighter. A most imposing bill of fare "for this day" hangs outside; within, we had a choice of roast mutton and beef, so we dined off old English fare, and hope we may always find as good beef and potatoes in more modern establishments. We watched with pleasure the paternal way in which the civil old waiter directed the hungry choice of a party of youths—we fancy they would not like to be called boys—who hesitated long between the relative attractions of beef and mutton, and divided their vegetables between them. The tariff comprises dinner at *1s. 6d.*, as well as by the plate, which the lads preferred, and got plenty for their money.

W.

Now that the "charity feeding" season is over, we may, without distressing the feelings of those philanthropists who believe that turtle-soup is the proper medium for extracting the benefactions of the tender-hearted, inform them that a very considerable proportion of the soup of which they have disposed during the last four months, is not made of turtle at all, but of conger-eel. A large trade is carried on in the Channel Islands in the conger-eel fishing, and the subsequent dressing of the fish for the London turtle-soup market.

A FRENCH journal, the *Santé Publique*, in an article on pisciculture in connection with general alimentation, gives the following *resumé* of the results of scientific research as to the relative value of fish and butchers' meat. The elementary composition of the flesh of mammifers differs little from that of fish, especially when dried; the blood of fish is less rich in globules; the amount of earthy salts is less in proportion to the organic matter in osseous fish than in reptiles, birds or mammifers; the skeleton of cartilaginous fish consists of a peculiar firm animal matter without calcareous deposit; the milt contains a fatty substance closely resembling that of the yolk of a fowl's egg; between the roe of fish and the eggs of birds the analogy is perfect; the fatty matter extracted from fish differs greatly in consistence, being oleaginous, semi-fluid, or nearly solid, according to the varieties from which it is obtained; the largest quantity is found in those fish in which it is in a fluid state. Finally, chemical analysis shows that fish contains all the constituent elements of a perfectly composed food. As regards nutritive power, the flesh of fish holds the second rank; it is as wholesome and more digestible than the flesh of mammiferous animals or of birds.

DOMESTIC HYGIENE.

No. 1.—THE KITCHEN RANGE—(Continued).

In the concluding paragraph of our previous article we referred to the unpleasant smells that too often arise from the kitchen during the process of cooking, and proposed to trace the origin of that inconvenience; and, if possible, to point out a remedy.

The cause then of this annoyance is an absence of any proper regulation of the currents of air through the kitchen, or, in other words, defective ventilation. The chimney being, as we have already stated, to some extent intended as a means of ventilation, if it do not carry off all the fumes arising from the combustion of fuel; as well as, in the case of a kitchen range, all the vapours consequent upon cooking, there must be something wrong in its arrangement or form. Let us for a moment trace the air currents of a room. By an old experiment of applying a lighted paper to the edge of a room door when it is closed, or partially so, it will be found, by the direction given to the flame, that there is constantly an inward current of air at the lower part of the door, and an outward current at the top. This arises from the fact that, heated air being lighter than cold air, it rises to the top of the room, and, escaping through the cavity between the upper part of the door and the door frame, its place is supplied by a current of cooler air, which, being heavier, enters from below. This lower current will be found to be much more powerful when there is a fire in the room, as then, besides supplying the air necessary to replace the escaping heated atmosphere, a considerable additional quantity is required to support the combustion of fuel in the grate, and the air thus supplied escapes up the chimney; whereas, when there is no fire there is a downward current in the chimney itself, which assists in supplying fresh air to the room. Bearing this principle of ventilation in mind, let us now trace the course of those vapours, or smells, which at times escape from the kitchen into the other apartments whilst cooking is going on. In the first place, were the ventilation of the kitchen perfect, all these fumes would escape up the chimney; but, in the absence of proper arrangements for this purpose, a portion of them escape into the kitchen, in the first place, and, rising with the heated vapours of the apartment, ascend until they fill the entire

space between the ceiling and the top of the doors; and it will be found by practical test that whilst the lower part of the room is almost free from smell, the upper stratum of air is strongly impregnated with the odours arising from cooking. If the top of the door leading into the outer air be above that of the inner door, a certain portion of these will escape into the atmosphere; but, as both doors are usually of the same height, they will by preference escape over the inner door, and so get into the other part of the house. This arises from the fact that the house itself acts as a huge chimney to the lower apartments, and the outer current of air is consequently stronger in the direction of the house than towards the atmosphere. The fumes, therefore, which are unable to ascend the chimney will escape into the house, and be carried by the ascending atmosphere into the passages and rooms on the lower floors above. It may, however, not unreasonably be asked why, under these conditions the smell is not strongest in the top storey, rather than on the floor immediately above the kitchen? A moment's reflection will explain this. If the heated air thus impregnated retained its initial temperature, we should undoubtedly find it most conspicuous on the topmost floor; but meeting, as it rises, with cooler currents, it not only becomes condensed, and so freed to a certain extent from its impurities, but by the admixture of a larger quantity of air the impurities become diluted; and, ultimately, as the air rises, all sense of their existence becomes lost.

There can be no doubt that the inconvenience to which we are referring exists to a much greater extent where the American kitcheners are employed than with an open range, in consequence of the draughts of combustion being conveyed up close flues; whilst a small register only furnishes the means of escape for the other vapours, and through which the draught is not sufficiently strong to carry them off. For this reason close-topped ranges are more likely to be offensive than those with open fires; but for convenience of cooking, the former are certainly more advantageous, in consequence of the whole top of the range being a hot-plate. A combination of the close and open range, such as is now being fitted to the Grosvenor Mansions, in Westminster, and which are manufactured by Messrs. Herring and Son, of Chertsey, whilst they possess, to some extent, the convenience of the hot-plate, do not obstruct the proper current of draught up the chimney, and are, therefore, not to the same extent liable to the defects of which we have been speaking.

In making these remarks we desire especially to avoid giving any opinion decidedly adverse to close ranges. We have known

them to act admirably, and to be free from the causes of complaint to which we are referring. From what we have already said, it will be understood that the smell of cooking in a house arises, not generally in consequence of a defective stove, but from a faulty chimney, or the bad setting of a stove.

It would be impossible to lay down any golden rule for the avoidance of the inconvenience, as each case must depend upon local circumstances. Every builder or professed chimney doctor will have his own remedy, consisting, probably, of some patent in which he is personally interested; but whilst all may be good under certain circumstances, each one will probably be found to fail in nine cases out of ten. The only scientific way of getting over the difficulty is either to increase the draught of the chimney through the orifice up which the fumes of cooking should ascend; or else to draw those fumes off from the upper stratum of air in the kitchen, as near the ceiling as may be convenient, either by means of a ventilator in the chimney, or by one communicating with the outer air from some part in the wall, as high as possible above the top of the kitchen door.

A simple yet effectual way of accomplishing the former object is by contracting the orifice of the register where necessary, and decreasing the open space round the front of the range, thus inducing a stronger current from the kitchen up the flue. This is quite practicable with a kitchen range, although it could not be applied as a remedy for any evils attendant on the fireplace of a sitting or sleeping apartment, because one of the consequences would necessarily be the shutting out of a portion of the heat of the fire from the room. This in the case of a kitchen would be no immediate drawback, as the fire would still be equally available for culinary purposes; but, under circumstances where the fire is merely required to heat an apartment, any contraction of the chimney-piece front would tend immediately to detract from the very benefits the fire was designed to contribute. Taking off the heated stratum of air from the upper surface of the room in the manner above suggested is but a modification of Dr. Arnott's system of ventilation, which is too well known to require any dissertation here.

F. C. Danvers.

THE WATER THAT WE DRINK.

Part I.

The present age is one of active, untiring enquiry. The call for, and publication of, a "Food Journal" is but an illustration of that activity, in a matter that concerns us all very closely, which plays an important part in our pleasures and comforts; and one, moreover, upon which the presence or absence of that greatest of all blessings, health, so largely depends. What shall we eat, and what shall we drink? This is a question asked by all alike—rich and poor. The philosopher cannot live on his philosophy any more than the student can upon his study. There are hours when the merchant leaves his desk, the scientific man his laboratory, the politician his papers, the physician his consulting room, the tradesman his counter, the mechanic his workshop, the labourer his hod and spade—and all alike ask one question, however different in each case the answer may be (sadly different we know too well):—"What shall we eat, and what shall we drink?" I presume there is no one article of greater importance in this question of meat and drink than water; and the extreme interest that has been excited during the last few years respecting its relationship to health and disease, must be my apology for venturing, at the request of the Editor of this Journal, to bring the subject before its readers. Some years ago it was hard to convince the public of the dangerous character of the water of some of our city pumps, and of the probability that they were the cause of several serious outbreaks of cholera, fever, and the like; but now-a-days the tables are turned, and the slightest appearance of any malady, from cholera down to a whitlow, is immediately supposed to arise from some impurity in the water. Indeed, people seem to have gone water-mad, heaping sins by cartloads on its back, of which, there is scarcely a doubt, it is entirely innocent. If these papers in any way succeed in quieting the unnecessary alarm that sundry sensational statements have occasioned, and yet at the same time point out that it is a subject demanding considerable attention and watchful care, they will not altogether be in vain.

Water itself is a curious substance, and nature seems to have designed its peculiarities for great and important purposes. It is peculiar in respect to its contraction and expansion, for whilst

most liquids expand on being heated at all temperatures, water (although it does not stand quite alone in this peculiarity) at certain temperatures contracts when heat is applied; and it is owing to this strange property that our rivers and lakes are prevented from becoming mere masses of ice during an intense frost.

Then, again, it is peculiar as regards its *specific heat*. The cook knows very well the length of time that is required for a large saucepan of water to become even warm, let alone to boil. Had it been full of alcohol or ether, it would not have taken anything like so long to rise ten degrees as when full of water. It is this peculiarity that maintains water in the liquid condition, and, indeed, renders impossible its existing long in any other form. I need scarcely stay to point out the importance of this peculiarity in the maintenance of animal and vegetable life.

Once again, I would note that water, of all liquids with which we are acquainted, possesses the greatest power of holding substances in solution. And this solvent power is not confined to its action on solids, but extends also to gaseous matter, the solution being mechanical in some cases, and chemical in others. The power that water possesses in taking up some gases is extraordinary. In the case of ammonia gas, 780 volumes are soluble in one volume of water; and, bearing in mind its vast solvent powers, there is nothing very extraordinary in the fact that absolutely chemically pure water is an unknown thing in nature. Rain water is contaminated with the ammonia and other gaseous elements with which it meets in its downward progress. Even snow, as Liebig has shown, contains a considerable quantity of ammonia. In using the word "contaminated" I merely intend to imply that rain water is not chemically pure, because there can be but very little doubt that the presence of ammonia is not altogether unimportant in its influence on vegetable life; nor is it unlikely but that the excessively invigorating effect produced on vegetation by a shower of rain may to a certain extent be due to its presence. I may just remark here that plants seem to revive more rapidly when sprinkled with water to which you have added a trace of ammonia solution, than when common water has been employed. I have tried this several times, and am convinced of its truth.

Then, again, as the water passes through the various strata, it takes up the several solid matters it meets with in its course. In some cases the amount of these solid matters will of necessity be somewhat great, owing to the solubility of the substances with which it meets. In other cases the amount will be very small, owing to their non-solubility. For example, Professor Brazier, of Aberdeen,

reports that the water of that town only contains between 3 gr. and 4 gr. of solid matter per gallon. In our London water it varies from 17·0 gr. to 17·5 gr. per gallon in the summer, and from 21 gr. to 23 gr. in the winter. We often find 30, 40, and 50 gr. per gallon, whilst in sea water the quantity is very much increased, until at last we find (in the water of the Dead Sea) above 2,500 gr. per gallon, the whole of which is held in solution by the water.

Now there are few things, perhaps, that have excited the interest of water drinkers more than the animalcules found in water, and about which so much has been written, and so many sensational stories told. It is of course easy enough to terrify children and weak-minded people with a microscopic view of a drop of bad water, or by throwing upon a screen by an oxyhydrogen microscope some huge ugly creatures floundering about with strange uncanniness, and consuming with giant appetites their weaker and smaller brethren; assuring them at the same time that these are present in unnumbered millions in every glass of water they drink, whatever caution may have been used to get rid of them. We all know how popular scientific books supply a pretty circular drawing said to represent the animalcules in a single drop of water, an assertion that is utterly erroneous, and most sadly liable to mislead the public as to the real facts of the case. This pretty drawing is, we need scarcely say, too often the production of an artist's fancy rather than the truthful sketchings of the cautious investigator. It is such sensationalism and exaggeration that have so often led the public (as those who have given their attention to sanitary medicine are constantly reminded) from sources of real danger to fix their attention on purely imaginary ones. Let me not be misunderstood. Unquestionably, animalcules are to be seen in waters containing animal and vegetable life in a state of decay; but it is a pure myth to suppose that any ordinary microscope will exhibit, as so many imagine, a world of creatures in every drop of water that you take from your cistern.

And, further, admitting their existence in some waters, we must not condemn them off-hand. Their presence in water is perhaps after all an advantage, for they must live, and to live they must eat, and so they feed on the organic matter which the water contains; and their work being finished, it is only to give place to a new generation that shall fulfil similarly important duties. But though, regarding their presence from a physiological point of view, it is impossible to say that they are injurious to health; still there can be no doubt that it is desirable, as it is certainly more agreeable, to remove them before the water is employed for drinking purposes

Fortunately they are never found in any of the metropolitan waters, for the careful filtration which the water undergoes at the works of the several companies supplying the metropolis entirely removes these useful though unacceptable visitors. It is right to say that if the water is kept in a vessel, and the slight deposit formed after several days is carefully collected, and examined under the microscope, numerous small animalcules will no doubt be found, moving about with wonderful rapidity. It may of course be argued from this that, though filtration keeps the animals themselves back, it still allows the ova to pass. This may be true; but surely it is not difficult to suggest other causes to explain their presence in such cases. In my next paper I propose dealing with the saline constituents of water, their advantages and disadvantages.

C. Meymott Tidy, M.B.

From the "Journal of the Society of Arts," we learn that the Philadelphians are making large quantities of artificial ice by means of water, ammonia, steam, and salt. The retort is used to heat the ammonia; a coil of pipe, through which steam passes, winds round the interior; 800 gallons of the ammonia are poured into the retort, and about 24 lbs. of steam applied. The gas arising from the ammonia is conveyed into a pipe at the top of the retort, which passes into a cooler filled with water, and thence into a liquifier; it is then thoroughly chilled, and becomes a freezing liquid. Connected with the condenser is another series of pipes, which diverge through a freezing box; the latter is filled with a strong solution of salt and water, which, with the aid of the ammonia, produces an intense cold. Into this box forty-eight brass cases are introduced, filled with fresh water, each of them yielding a 24-lb. slab of ice, 4 in. thick, 2 ft. long, and 1 ft. broad. It takes four hours to freeze the whole forty-eight. This ice costs 50 per cent. less than the ordinary ice.

We do not appear to have yet got to the bottom of the difficulty about the quality of our drinking water; nor does bad water, rich in organic solutions, seem to be necessarily the cause of disease, if we are to believe the observations of Professor Max von Pettenkofer, contributed by him to the *Medical Times*. Amongst them, he quotes from the Rev. Mr. Hotte, a school inspector in Wachenzell, who declares that the cattle of that district infinitely prefer the black water that soaks from the farmyard to pure rain or gutter water. The Professor says: "I have observed with astonishment this foul water, and the strong-horned cattle that sipped so contentedly the fluid, which was regarded by the inhabitants as strengthening broth. I can remember seeing in Souversholz, at a prosperous farmers', a well near the dung heap, which appeared to me, by its position and the fluid it contained, designed as a proper receptacle for liquid sewage. Knowing the general neglect of the liquid manure by the farmers there, I was very much astonished, and expressed to the owner my approval of his being a praiseworthy exception, and collecting his manure for the field. He at first did not understand me; but, on taking my meaning, he assured me, with a cunning smile, that this supposed liquid manure was worth more to him as a drink for his cattle." This is, indeed, a new phase of the sanitary question!

NEW BOOKS.

"MENTAL EXERTION: ITS INFLUENCE ON HEALTH" is an old friend with a new face, written some years ago by an American physician, Amariah Brigham. In the United States it passed through several editions. Mr. Hotten, of Piccadilly, takes it under his protection, hoping for similar results in this country, and entrusts the editorial province to Dr. Arthur Leared, who adds a short explanatory preface, and a chapter on the indigestion of literary men. The form of the work is popular, the style clear and unaffected, and some of the facts adduced of great practical interest. Its aim is to point out the fallacy, nay danger, of over-education in the young, and the necessity of balancing mental with physical exertion at all ages. Infant wonders, who can repeat "Young's Night Thoughts" without a blunder, or tell the distance between Jupiter and the earth, without misquoting a cipher, are not to be encouraged in these feats of mental agility, but should rather be taught the use of the skipping-rope, or indulge in the *abandon* of a game at bat, trap and ball. We see that mental precocity is only the too sure sign of cerebral disease; and if parents are foolish enough in their pride of these infant prodigies to foster this precocity, they are acting the part of literary Medeas, killing their offspring more slowly, but no less surely. The information contained in this little work must be valuable indeed in America, for we learn that in Hartford, U.S., nearly all the children of the city commence attending school as early as the age of three or four, and attend six hours each day for several years. We also learn that the proportion of insane to sane persons in America is one in every 262; in Scotland it is one in every 574; in the agricultural districts of England it is one in 820; in London the proportion is one in 400. We see thus that insanity is more prevalent in cities, and less so in the country, evidently due to the greater strain made on the mental faculties in cities, and to the fact that mental activity is there also allowed a greater scope. Political liberty, singularly enough, has some hand in this matter; for in countries under a despotic government insanity is rare, as in Turkey, China, and Russia. Dr. Brigham affirms also that it is, or rather was, uncommon in Spain, out of the large cities: it will be a curious physiological enquiry to discover whether the recent Spanish revolution has increased, or will increase, the tables of insanity. Dr. Leared's chapter, though interesting, is scarcely new; but his notes are valuable, and he deserves our thanks for redirecting attention to a most important branch of sanitary science.

"OUR BODIES" and "THE ANIMAL KINGDOM" (Ellis A. Davidson) are very interesting accessories to Messrs. Cassell's Primary Series. The former is adapted for boys of about fourteen, and the latter for anybody above sixteen who wishes to have a clear idea of the division of the animal kingdom. If the teachers of youth could themselves master the principles of physiology, it would be greatly to the health advantages of those committed to their care.

Mr. Twining's suggestions on popular education, entitled "SCIENCE FOR THE PEOPLE," are worthy of all praise; but, though they are so eminently practical, we fear they are a long way in advance of the age. Two points deserve our consideration: one, that he makes science the handmaid to health, and the other, that, whilst advocating the cause of science, he does not neglect the humanities of art and literature. If the British workman would consent to be enlightened after Mr. Twining's fashion, we should have less drunkenness, less wife beating, less

murder; cheerfulness would take the place of grumbling discontent; health would be as sacredly guarded as morals; and, with a purer, healthier, more intelligent working population, the prosperity of the English nation would be significantly advanced. All honour to Mr. Twining—all success to his efforts.

The Rev. J. Montgomery gives us, in "THE WEALTH OF NATURE," a series of short but interesting chapters on the value and variety of vegetable food. After the bare enumeration of fruits and vegetables that supply us with nutritious and palatable food, we might consider ourselves independent of cattle plagues or potato famines; for, by varying our food supplies, we should ensure safety against dearth when one particular product fails; especially when, as in the case of the potato, failure is famine. Though we would advocate variety of food, yet prejudice is hard to conquer; for Mr. Montgomery tells us that maize "was scarcely at all imported until the Irish famine of 1846; and when it was then distributed in Ireland, starving wretches were absolutely unwilling to receive it, and regarded their misery as insulted when it was offered." Such excessive ignorance is scarcely bliss. We need not be deterred from trying to introduce varieties of grain or fruit, when we learn how wide is the range of some natural products; and though we may not be able to grow all varieties, we can at least import the less costly, and so accustom the national palate to their use, when English wheat and Irish potatoes show signs of failure. This same maize, or Indian-corn, does not thrive in Great Britain, but it is so prolific in America that it has been known to yield eight hundred fold; and, together with this profusion of growth, we know that it is highly nutritious, and that the meal is cheaper than that made from any other cereal. It only rests with the housewife and the baker, by making it palatable, to ensure its popularity. Many of us are profoundly ignorant of the value of certain plants as food, that are allowed to spring up and die, uncared for by all but the botanist; and it would be a matter of interest, as well as instruction, to take note of the different foods with which nature supplies us in the fields and woodlands, unappreciated because their properties are unknown. It is well known that the common cuckoo-pint (*arum maculatum*) contains large quantities of starch and saponine in its corms that can be extracted without any excess of ingenuity or labour. Indeed, it goes by the name of the "Portland sago" in Dorsetshire, where it grows in great profusion, and the inhabitants have the good sense to utilise it. We know too that the seeds of water lilies are wholesome and nourishing food, and that the Victoria Regia supplies large quantities of food in its almond-like seeds. We should not forget that chestnuts form an important item in the food supplies of France. Why then should we keep them for dessert, or forget them at breakfast or supper, when they make such a cheap and pleasant substitute for bread? Again, how is it that mushrooms should be used so timidly, and left to rot by thousands in field and forest, when, with a rise in the price of flour, or of meat, they might and ought to give dinners for numberless cottagers, whose children could gather these "vegetable beefsteaks" with ease and with profit? Is there not the common mushroom, and the fairy ring mushroom or Scotch bonnet, the blewitt and the orange-milk mushroom, the morrell—and might there not be the truffle, had we less pride in borrowing from our neighbours, and more ingenuity in utilising the loan? How is it that France is ahead of us in prizing these fungi as delicacies, and Italy very far ahead, so that 4,000*l.* worth yearly are sold in the market place of Rome? We pride ourselves on our roast beef; let us not have to blush for the scantiness and dearness of our vegetable accompaniments. M. Roques has called mushrooms "the manna of the poor," and yet in England the poor do not consider themselves divinely chosen enough to gather this manna. Again, even the seemingly barren shore has its food for those who will seek it. Of the numberless seaweeds growing on our

coasts, there is not one species known to be actually poisonous, and many are very nourishing. The carrigeen, or Irish moss, enjoys the greatest popularity; dulse, laver, tangle, and bladderlock are other species that have been used and found palatable. Dulse is eaten by the Icelanders with fish, being dried and stored for that purpose. It contains sugar enough to produce alcohol for the Kamskatchans; whether it makes them of a merry heart, Mr. Montgomery has omitted to tell us. Laver is actually considered a luxury in some houses, and eaten with salt and pepper, or vinegar and lime-juice. The celebrated birds' nests that make such rich soups for the Chinese gourmets, are formed of seaweed, of the genus *gelidium*, being extremely gelatinous. If seaweed is so delicate a luxury that the birds' nests when cleaned and ready for the cook are sold at prices ranging from 2*l.* to 7*l.* per lb., why should we ever be allowed to exclaim—

"Oh! the dreary, dreary moorland; oh, the barren, barren shore!"

Dr. Guy's lectures on "PUBLIC HEALTH," condensed into a popular compass, and issued by Messrs. Renshaw and Son, of the Strand, form one of the most agreeable additions to medical literature that have appeared for some time. The subject is treated historically rather than scientifically, and is thus more adapted for general reading; but, at the same time, we doubt not that there are many facts of medical history given us which are as new to readers of the "Lancet" as to readers of "Cornhill" or "Macmillan." These lectures will not only interest—they will instruct the medical world,—for, by a knowledge of past dangers, they will be better able to meet those to come: such records of national disease will stimulate us to live up to a healthier and purer standard than that adopted by our ancestors; and, with a knowledge of the cause of epidemic disease, we shall more surely find the preventive, which is better policy than merely adopting a remedy, or what makeshifts in medicine we may dignify with the name of remedies. In looking through Dr. Guy's most interesting lectures, we learn a few curious facts; that the disease known as black death, which ravaged Europe in the fourteenth century, is identical with the plague that came from the East, and made the year 1665 a year terrible in the annals of English history; that the sweating sickness was similar to our modern, and we might almost add, fashionable influenza, that it was almost peculiar to the English nation, and traceable to their habits of gross eating and foul living, and that "the Englishman abroad" was sure to be an early victim to this affection, were it epidemic in his line of travel. Diphtheria also is an old disease, respectably so, for mention is made of it in the early part of the sixteenth century, when it made great ravages in Holland and Switzerland, destroying in Basle no less than 2,000 people in the space of eight months. After reading these appalling accounts of the fierce onset made by disease, and also of the barbarous mode of life in the good old times, we feel really grateful to Dr. Guy for making us so thoroughly contented with the deficiences (?) of our own time. Nay, indeed, when we touch on the state of the prisons in the eighteenth century, when Howard found that water, air, and light, were denied the wretched inmates in many instances; and that, in consequence of the horribly filthy condition of these dens of disease, a fever atmosphere hung about the prisoner when brought into court, and his very presence infected all around him, from the turnkey to the judge, may we not congratulate ourselves on the progress made since then in sanitary science? But we have yet much to learn; gaol fever and plague are matters of past history, but it is not long since cholera visited these shores; and, where the laws of health were least regarded, there were to be found its most numerous victims. This long drought may be followed by a rainy autumn; if so, we must keep a vigilant eye on the state of public health.

DOMESTIC RECIPES.

The Editor desires to appeal to his readers, and especially to the ladies, for contributions of recipes for cheap, tasty, and serviceable dishes, both for poor households and those of the higher classes.

GINGERBREAD PUDDING.

Take equal quantities of flour, bread crumbs, and suet, one or two eggs, four table-spoonfuls of treacle, and a table-spoonful of ground ginger; boil, in the shape of a plum pudding, and serve with custard around it, carefully beaten up in a glass of sherry.

COCOANUT TOFFY.

CHOP a cocoanut into small pieces; mix one pint of milk and four tablespoonfuls of treacle; boil over a hot fire, adding ¼ oz. of butter and the chopped cocoanut. When sufficiently boiled, pour into a soup-plate, and leave until perfectly hard.

MOCK PATE DE FOIE GRAS.

Pâte de Foie Gras, though universally admitted as a delicacy of the highest order, is rarely consumed by the modest middle-class families of England. Its very high price is the very simple cause of this fact. We have thought, therefore, that it might prove useful, if we were to indicate how a very good substitute could be made at a more moderate cost. It is impossible to dispense altogether with the fowls' liver; but two livers from either goose or turkey will suffice for a good sized terrine of what we will term "mock pâte de foie gras." A stuffing or *farce* must be made from 1 lb. of suet or fat of pork, with an equal quantity of calf's liver, obtained as white as possible. The suet, cut into small pieces, is melted on the fire, and incorporated with the calf's liver which has been skinned and cut up. Add pepper, salt and spice, and place the dish on a very hot fire for five or six minutes, during which time the saucepan must be constantly shaken. When this has been allowed to cool, it should be forced through a sieve with holes of a moderate size. The *farce* thus made, a part of it should be spread in the terrine or gallipot which is to contain the foie gras. The livers of the goose or turkey are then added, accompanied with a good deal of seasoning, and the terrine is finally filled up with the remains of the *farce*. On the top will be placed two laurel leaves, and the whole carefully covered with a layer of lard. The terrine may then be closed and placed in a saucepan only half filled with water, so that the ebullition should not enter into the pot. By boiling the water, the foie gras may thus be safely cooked.

BŒUF A LA MODE, FOR SUMMER-TIME.

Brown a piece of beef (3 lbs.) and a calf's foot, with 1 oz. of butter, in a covered saucepan, for an hour; then pour the grease off (the real gravy will adhere to the saucepan), and add six spring onions, some new carrots, a tablespoonful of vinegar, a pinch of flour, a dozen pepper-corns, salt, a bay-leaf, a piece of thyme, and parsley. Simmer the whole on the side of the fire for three hours. The thyme, parsley, and bay-leaf ought to be tied together, so as to be taken out, as well as the calf's-foot, before serving.

GREEN PEAS.

An excellent way of preparing green peas, when small, is to cook them without water, in butter alone. For this, 3 oz. of butter are necessary for half a peck of peas, and they must remain for an hour and a half on a slow fire, in a copper, or still better, an earthenware saucepan, well covered in either case. An onion, a piece of parsley, and a lettuce leaf or two, cut small, must be stewed with the peas, and the saucepan must be carefully shaken every few minutes to prevent the peas from burning. It is better that the peas should not be washed beforehand. When peas are boiled in the water, the French cook also adds an onion and lettuce leaves; then, ten minutes before serving, strains the water off; and, adding a piece of butter (the size of two large walnuts), and a lump of sugar, tosses them over the fire for the remainder of the time.

POTATO BREAD.

Grate your potatoes very fine, and proceed as in ordinary bread, using the potatoes instead of flour; sweeten to taste. This dish is much improved by grated cocoanut.

TO PRESERVE PEACHES.

A correspondent, Mr. Smith, of Exton Park, has handed us (*Gardeners' Chronicle*) the following reply to an inquiry as to the best method of preserving peaches:—"The following is the recipe given to me by the *chef de cuisine* here: Split the peaches in halves; scald them in thin syrup to remove the skins; arrange the halves in clean pint tins filled up with rather thick syrup, made of 2 lbs. sugar and 1 pint cold water; boil for four minutes; have the tins covered; put them into a vessel; pour sufficient cold water on to them to reach within half an inch of the top; submit them to twenty minutes' gentle boiling; keep in a cool place for use."

MACEDOINE DE FRUITS.

This is certainly the best way of eating uncooked fruit, and particularly when it is not of the finest. The method is simple enough. White and red currants, cherries, ripe gooseberries, and raspberries, are mixed together in a deep dish, after being picked; sufficient white sugar, according as the fruit is more or less acid, is placed in water enough to dissolve it, and poured, when melted, over the fruit, which must then stand for two hours before being put on table. Thus prepared, it acquires the rich taste of cooked fruit, and yet retains all its freshness. If the means of icing be available, the *macédoine* ought to be put into a mould and iced, when it makes a most *recherché* dish for dessert.

NOTES OF THE MONTH.

THE Suez Canal, with the many advantages which are undoubtedly in prospect, is causing a good deal of lamentation in certain quarters, and especially in the tea trade; which, for a time at least, is likely to be considerably deranged. The time hitherto taken in the passage by the old tea-clippers will be reduced by two months, and the effect will be, not only that the clippers will be rendered useless, but that the six months' stock, now carried over from one season to another, will be so increased as to become a heavy burden on the market. Moreover, the new crop teas will arrive in July, the very dullest time of trade. As we pointed out in our March number, a great deal of the Russian tea commerce will be diverted to Odessa direct, simultaneously with which the presence of Russian agents in China will increase the competition amongst the buyers there.

WE are glad to hear that Professor Gamgee's process of preserving meat has stood the test of a voyage across one of the longest ocean tracks of our trading ships (sail and steam), viz., from England to Australia. Captain Atwood, of the screw steamship "Somersetshire," writes that the meat which Professor Gamgee sent to him on the 26th January last had been cooked on the Thursday of each week on the way out. The passengers were not aware that they were served with preserved meat, which, throughout the whole voyage, was perfectly sweet. In the warm weather it was much better and more tender than fresh meat killed on board.

"A LADY HOUSEKEEPER" thinks it may be useful at this season, when fruit preserves are about to be prepared and potted, to call attention to the fact that raspberry jam is very commonly mixed with other fruit, chiefly with strawberries. This practice may not come strictly under the definition of adulteration, but, properly regarded, it is certainly a fraud; the fact that strawberries are much more plentiful than raspberries, will account for the admixture of the first to eke out the second, and pass it off as genuine raspberry jam. But there are few people who would not prefer paying more if they could get what they want, rather than have a mixed article placed in their hands as a pure one. Perhaps the experience of other correspondents may be elicited on the subject by these remarks.

WE have received from M. Jacques Barral a report of some very practical results from the beet-root distillery erected by Mr. Campbell, at Buscot, near Farringdon. The machinery is that of M. Savalle Fils, of Paris, who undoubtedly has a speciality for excellence and economy in the construction of this class of engineering works. The specimens sent us by M. Barral consist of a very pure beet-root spirit (68·8 O.P.),—some verbena scent made by the help of the same—and, what is better than all during this hot weather, a large bottle of milk punch, in which the beet-root spirit was again the principal component. There can be no doubt whatever that, in addition to the sugar and other useful products, as detailed in our article on "Beet," in the third number of this Journal, the distillation of the root will in due course play an important part in the economical resources of the country.

The following statistics from the *Gardiners' Chronicle*, show the importance of the market-gardeners' trade in Paris. 134,000 tons of vegetables and salad are annually raised from 300 acres in the neighhourhood of the city, and give employment to 9,000 persons, and 1,700 horses. As auxiliary to the raising of vegetables, 360,000 glazed frames and 2 millions of bell glasses are constantly in use. The amount of manure annually employed is estimated at 72,400*l.*, and the total receipts of the market gardens at half a million. In addition to this, however, there is a large importation of fruit and vegetables from different parts of the country.

The biggest pie on record was made at Lowther Castle, in Westmoreland, in the year 1762, and was sent up as a present to the King. It contained 2 geese, 4 ducks, 2 turkeys, 4 wild-fowls, 1 wild goose, 6 wild ducks, 3 teal, 2 starlings, 12 partridges, 15 woodcocks, 2 guinea-fowls, 3 snipes, 6 plovers, 3 water-hens, 6 widgeons, 1 curlew, 46 yellow-hammers, 15 sparrows, 2 chaffinches, 2 larks, 3 thrushes, 1 field-fare, 6 pigeons, 4 blackbirds, 20 rabbits, 1 leg of veal, half a ham, 3 bushels of flour, 2 stone of butter. The whole pie weighed 22 stone. This must have been the original pie commemorated in the nursery rhyme—

"When the pie was opened
The birds began to sing;
Was not this a dainty dish
To set before the king?"

BOOKS RECEIVED.

"The Life Assurance Bill." Rixon and Arnold.

"What Shall we Teach: or Physiology in Schools." By E. Lankester, M.D., F.R.S. Groombridge and Sons.

"The Dietetic Errors of the People: and the Use of Sugar, the Primary Cause of Consumption. By John Storie.

"A Resumé of the History of Hygiene." By Professor Corfield, M.B. Lewis, Gower Street.

"Beer Scientifically and Socially considered. By James Samuelson. Longmans.

"The Laboratory Guide." By Professor Church. Second Edition. Van Voorst.

"On Diet and Regimen. By Horace Dobell, M.D. Fourth Edition. Lewis.

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THE

FOOD JOURNAL.

FOREIGN OFFICE REPORTS ON THE ADULTERATION OF FOOD, ETC.

THE recent debate on the subject of adulteration of food and drink, during the session that has just been concluded, gives us some hope that this very important question will, ere long, receive the attention which it deserves; and we trust that, next year, legislative enactments of a sufficiently comprehensive character will be passed for the protection of the health and pocket of the long-suffering British consumer. But, while congratulating ourselves on this improved state of public opinion, it is our settled conviction that, to enable a really useful Bill to be framed, a collateral knowledge of the laws of other countries is absolutely necessary; the more so as the paternal governments of Continental kingdoms adopt a wise system of controlling these matters, with a minuteness to which we are strangers. It seems to us that the favourite motto of "Live and let live" is carried too far in England; and many cases might be quoted in which "to let live" appears to be the very last thing that is contemplated.

Acting upon this conviction, we some months ago applied to the then Secretary of State for Foreign Affairs (the late Earl of Clarendon), for permission to address Her Majesty's Secretaries of Legation and Consuls for information on all matters connected with provisions, supplies, weights and measures, markets, etc.; and we have to express our deep sense of the valuable assistance which his Lordship at once placed at our disposal, and which the kindness of his successor, the Right Honourable the Earl Granville, has continued to us. At the Earl of Clarendon's request a circular was drawn up, containing the following questions, and a copy forwarded by the Foreign Office to all Her Majesty's Legations and Consulates:—

"1.—What Legislative enactments at present exist, and when passed, in the country to which you are accredited, respecting Adulteration of Food and Drink? Are these

laws actively enforced, and how far do they appear to meet the evil?

"2.—The same with regard to short Weights and Measures in the sale of Food and Drink?

"3.—The same with regard to the sale of live Cattle and dead Meat; the taking and sale of Fish (salt and fresh water); and the sale of Agricultural produce?

"4.—What Laws exist, and when passed, as to the Inspection of Food, and Regulation of Markets generally?

"5.—Add any analogous information likely to be useful, not embraced in the above queries."

By means of the information, so valuable to the country at large, thus accorded to us by Her Majesty's Ministers, we shall be enabled to lay before the readers of the "Food Journal," from time to time, a systematic series of reports of the Food laws and regulations of other countries, the importance of which cannot well be overrated.

At first sight it may appear as if the regulations of one town were very similar to those of another. As far as the laws of the *State* in which these towns are comprised, this will undoubtedly be the case; but it must be remembered that *municipal* or police ordinances vary according to the place, being affected by divers local conditions. The first reports with which we have to deal are those touching the cities of Hamburg, Leipzig, Konigsberg, and Memel; and we shall for the present confine our remarks to the question of food adulteration.

HAMBURGH, according to Consul Ward, has no special legislative enactments regarding the adulteration of food or drink. Police regulations have been made at various times, based upon the general principle that the sale of adulterated articles is considered fraudulent; but the enforcing of these regulations is usually left to individual energy, and with such good effect, that the police authorities rarely have any complaint made to them. There is, however, a tolerably severe law in the Hamburgh Criminal Code, dated April 30, 1869, running thus: "Whoever, without intention to injure another, shall knowingly adulterate any wares, articles of food, or other articles of general consumption, by admixture of any substance which may be injurious to health, irrespective of his knowledge of such injurious effect; or whoever shall knowingly sell such adulterated articles, shall, in cases where their use has produced lasting injury to speech, sight, or hearing of any person, be liable to imprisonment for a term of from three months to four years; in other cases, to imprisonment for not more than six months, or a fine not exceeding 200 dollars" (30*l.*).

Leipzig.—From Consul Crowe we learn that Leipzig has no special legislative enactments in the matter of adulteration, and what little is done falls within the province of the municipal and police authorities. The oldest regulations in force at Leipzig for the government of markets date as far back as 1726, though additions have been made (the last in December, 1869), as the spirit of the times demanded. No food, adulterated or unfit for use, can be sold under a penalty of 50 thalers (7*l.* 10*s.*), or a certain term of imprisonment. Particular attention is given to rye bread, which it is forbidden to expose for sale unless perfectly pure. In practice the police only interfere *when the bread is proved to be adulterated with injurious matters*. When it is merely impure and not injurious, the buyer has his remedy in the ordinary tribunals. It is admitted, however, that these regulations only partially meet the evil, and there is an evident and general wish that some new legislation should be brought forward. No one in authority thinks of enquiring whether coffee, tea, or pepper, be adulterated, unless they are proved to be deleterious; and, in fact, it is nobody's business to enquire into it.

Konigsberg.—Consul W. J. Hertslet reports that at Konigsberg the penal code of Prussia (law of April 14, 1851) is in force (see *post*), and is generally pretty strictly administered. During the last few years several butchers in this town have been severely punished for selling pork or flesh of pigs which contained *trichinæ*. Some of the law courts, however, were in doubt whether the sale of trichinatous pork could be brought under the law of 1851; and, accordingly, a new law was passed in May, 1870, which expressly provides that persons who sell or offer for sale adulterated or spoiled articles of food, and *especially meat containing trichinæ*, are to be punished with a penalty of fifty thalers, or imprisonment.

Memel.—Vice-Consul Ward states that in Memel the Prussian penal code is in force as follows (law of April 14, 1851):—"Any person selling or exposing for sale adulterated or spoiled (*verdorbene*) food or drink shall be liable to a penalty not exceeding 50 dols. (7*l.* 10*s.*), or to be imprisoned (without hard labour) for any term not exceeding six weeks. On the conviction of any person for such an offence the confiscation of such adulterated or spoiled food or drink is to be ordered forthwith." Adulteration here means every addition or admixture of any heterogeneous matter. This enactment is not only meant to refer to cases in which the adulteration of articles exposed for sale is prejudicial to human health, but it is intended to convey the absolute prohibition of selling such articles, *without the existence and nature of the adulteration being made known*. It is, moreover, unnecessary that the vendor be aware of the adulteration as far as

liability to the penalty is concerned. The law then goes on to provide (Section 304) that "if any person shall wilfully poison wells or water reservoirs used by others, or articles destined for public sale or use, or if any person shall mix with or add to the same any substance which he is aware is likely to destroy human health; likewise, if any person shall knowingly, and under concealment of their nature, sell or expose for sale any articles poisoned or mixed with dangerous substances, every such offender shall be imprisoned with hard labour for any term not exceeding fifteen nor less than five years. If, in consequence of any such act, any person loses his life, the offender shall be punished with death. If the cause of any such act be *carelessness*, and if any damage has been occasioned thereby, the offender shall be committed to prison (without hard labour) for any term not exceeding six months; and if, in consequence of any such act of carelessness, any person shall have lost his life, the offender shall be committed to prison (without hard labour) for any term not exceeding two years, nor less than two months." For wilful injury by exposing for sale articles unfit for food, Section 197 directs that the offender be imprisoned (with hard labour) for any term not exceeding ten years. If severe bodily injury has resulted, the term is for not less than ten years, and may be increased to twenty. If death ensues, the imprisonment is for life. This law does not refer to cases in which the offender acted with the *intention* of killing. Mr. Ward observes that these laws are considered by most authorities to be sufficiently severe; and, as they are carried out with great strictness, cases of adulteration occur but rarely in the Memel district.

[TO BE CONTINUED.]

SUPPLY OF SALT.—The *Patriot*, of San Jose, California, gives the following account of the great mine, or rather plain, of salt which lies about eighty miles N.W. of Austin, in Nevada territory, and not far distant from the railway. The mine is thirty miles long by about twelve or thirteen miles broad, without any break or interruption. The surface presents the appearance of a frozen lake with a light sprinkling of snow over it; the first stratum of salt is from twelve to fourteen inches in thickness, beneath which is a layer of argillaceous mud of an uniform depth of two feet; and under this again is the principal layer of salt, the thickness of which has not been ascertained, although a shaft has been sunk to the depth of several yards. The salt of this main stratum is described as being hard as quartz and clear as glass; it is also stated to be remarkably pure, containing only 5 per cent. of soda. The world will not want salt for a time at any rate.

HOW FOREIGNERS LIVE IN LONDON.

Part III.

In Great Windmill Street there is a large rambling building which was once used for dissecting purposes. Young medical students were wont to spend their days there, studying anatomy in the most practical manner possible—namely, with the dissecting knife in hand, and dead bodies before them. But, at last, the growth of hospitals in London, and the opportunities which they offered for study, rendered it no longer necessary to maintain these large premises in Great Windmill Street. Thus the building in question was offered for hire to the public at large; but no one would venture to take a place to which was attached so unsavoury an odour. People shuddered as they entered its cold, chilly rooms, and conjured up in their imagination ghosts of victims torn from their graves by body snatchers. At last, after a long lapse of time, some French sisters of charity thought themselves pious enough to brave the shadows of the dead. They rented the building, and converted it into a sort of convent; but for some reason they found themselves obliged to give up their residence, and their quiet retreat became a favourite resort for those questionable characters who are always hovering in the immediate vicinity of the Haymarket. It was only after some years' lapse of time that an Italian came forward, and offered a ludicrously small price for premises so extensive. Notwithstanding the smallness of this offer, so great was the prejudice against the place that it was accepted. On the other hand, the Italian's friends lifted their eyes to heaven, and gave him up for lost. They could not lament too loudly that a countryman of theirs, who had arrived in London with only the proverbial halfcrown in his pocket, and who, notwithstanding, had succeeded in accumulating a little capital, should thus recklessly ruin himself by taking so large and so objectionable a house. Signor Govanini, however, felt better confidence in himself. Opening at first but a part of his house, he placed in it what was most profitable, that is, as many billiard tables as he was able to afford. To the persons seated around he sold the numerous light refreshments which are to be obtained at all French

cafés; and thus the dissecting room and the convent became a *café billiard.*

Well, even with all this, I shall be asked how foreigners live in London. My answer is, that they spend a considerable portion of their lives at the Café de l'Etoile, in Great Windmill Street, as the restaurant, hotel, and "billiard" of Signor Govanini is called. But there is one most important detail in the foundation of this café which it would be unjust for me to omit: while, at first, Signor Govanini was obliged to tolerate the influx of disreputable characters, he immediately dismissed all persons whose character might bring discredit to his house, as soon as it was sufficiently known to secure him a moderate custom apart from them. Thus it was that, though I have frequently visited this café, I have never witnessed anything which might offend the most punctilious moralist. It is essentially a resort for foreigners and for billiard players. With the latter I have nothing to do—indeed many of them are Englishmen, and therefore excluded from my subject—but the former present a most interesting group. There are a few Italians, a still smaller number of Germans, but a vast majority of Frenchmen—a laughing, chatting, noisy, merry band. While watching them, one forgets that the Café de l'Etoile is, of all countries of the world, in England. There is but one thing decidedly English about the place—the dingy, dirty ceiling. The red velveteen seats and stools, the white marble and iron tables, the maze of looking glasses, the neatly aproned waiters—all are French, thoroughly French; but a London atmosphere alone could blacken the ceiling in such a manner. This, however, does not seem to have sobered the gaiety of Signor Govanini's customers. How freely they talk with each other,—what a contrast between this and English houses! You can come here and order a "bitter" or an "absinthe"—it will cost 5*d.*, and 1*d.* to the waiter makes a sum total of 6*d.*; you are then at liberty to spend several hours in these spacious rooms, comfortably seated, talking and laughing with your friends, and often with the strangers around. Whatever you may order, however long you may stop, you are treated with the same respect and attention. The customers, therefore, are of a very mixed description. The last time I was there, I noticed opposite me the correspondent of the *Liberté*, and the correspondent of the *Petit Journal;* next came a group of meerschaum pipe carvers; while the rear was covered by commercial travellers; and on my left there sat a French dealer in dripping. The latter is a man of no small merit—a thorough master of his language, a good scholar, and the inventor of many ingenious mechanical combinations. During a part of the week he spends his time going

from house to house, buying small quantities of superfluous dripping from cooks, etc., and then selling it wholesale to the fried fish and potato shops. The days not engrossed in his business are spent by this original character in the different libraries and booksellers' shops of London. With the money earned by selling dripping he has been able to collect a library of more than a thousand valuable books. In the evening this most worthy bookworm comes to the Café de l'Etoile, to enjoy a cup of coffee and several hours' talk with a friend or two, about books—nothing but books!

Apart from the café, there is a restaurant, the chief feature of which is a dinner for 2*s*. Several foreigners partake of this meal; but the dinner cannot be compared to those obtained at the Palais Royal for 2 fr. 50 c.; and, even in London, 2*s*. will procure a better French dinner than this one. As half a bottle of vin ordinaire is included, the dinner is certainly cheap, though unsatisfactory. It was, after all, but a dinner in miniature. The last time that I dined there, a plate of ill-seasoned weak French soup was brought me, and then a lilliputian sole, well, but most plainly cooked. The good point was the promptitude with which the successive dishes were served. There is no ordinary; every one has the same thing, and each course is brought up the instant that you have finished the previous one. After the fish, I had a plate containing a piece of veal three inches square and half an inch thick; with it there was about half a potato mashed, and some gravy. The cooking was good, but simplicity itself. Afterwards followed the smallest leg of fowl which I ever saw, together with two very green outside lettuce leaves. Over these was far too much vinegar, and seemingly nothing else; while the chicken bore a flavour of some most objectionable grease. The dessert which followed was more liberal; it consisted of about a cubic inch of cheese, succeeded by six nuts, two almonds, and fifteen raisins of a quality which can always be procured at 5*d*. per lb. Yet, after all, I ought not to complain. Small as each dish may have been, there was a certain satisfaction in so much variety for so little money; and this style of dinner is difficult to supply with profit, unless the customers are very numerous. If English "ordinaries" aimed at a little more variety, and the Café de l'Etoile attempted to give more substantial helpings, both might mutually improve each other.

Adolphe Smith.

NATAL AND ITS FOOD RESOURCES.

Part II.

Wheat has been always grown in the uplands of Natal since the colony has fallen into civilised hands. But hitherto much less has been produced than is needed for its own consumption, mainly because the season of the natural harvest is essentially a wet period, so that the grain is liable to rust. There is one species of wheat, known as the klein corn, which clings very tenaciously to the husk, and which is more hardy than most other kinds of wheaten grain, and is a great favourite with the Dutch farmers on account of its comparative immunity from rust. The proper and radical remedy for this mischief is, however, most probably, the general adoption of the practice of growing wheat during the dry season of winter under artificial irrigation, and perhaps, also, in some very considerable degree, the application of improved methods of draining the land. Very fine wheat crops are now produced under irrigation by some of the most skilful farmers; and, even under the dim light of present experience, it may very safely be predicated that wheat will yet be very largely grown in the upland district, and among the hills, of Natal. At the present time about 3,000 acres of cultivated land are occupied by wheat crops, and the annual produce of the grain is returned as about 36,000 bushels; that is, it will be observed, scarcely more than two bushels for each European inhabitant. The value of the wheat flour imported into Natal during nine months of the last year was nearly 15,000*l.* sterling. It need scarcely be said that the consumption of maize, even by the European inhabitants of the colony, is a very large one. Maize is naturally a very wholesome and agreeable, as well as a very highly nutritious form of grain-food in all climates as warm as that of Natal.

The remarks which have been made in regard to wheat apply, with perhaps some diminution of force, to the hardier grains of barley and oats, which are both liable to injury from rust; but they can be very advantageously grown, under skilful management, in the Natal uplands.

Sugar and coffee are, now, both established productions of the Natal coast district. The cane was introduced from the Mauritius in the year 1849. Coffee was first planted near Durban, about the

year 1856. In 1868 the export of sugar from Natal was 4,662 tons, valued at 90,000*l.* sterling. In the year 1869 the export was 7,486 tons, valued at 145,000*l.* sterling; and it was estimated that another 1,000 tons of colonial production were consumed in the colony, giving approximately 8,500 tons for the production of the year. In the year 1868 the export of coffee was 27 tons, worth 2,425*l.*; and in 1869 the export was 80 tons, worth 5,011*l.* At the end of the last year, there were 5,500 acres of land under sugar cane and 2,163 acres of land under coffee; and it is stated that not less than 600 other acres have been planted during the present year.

The planting of both sugar and coffee in Natal is principally confined to a district not extending further from the sea than from sixteen to twenty miles. Kafir labour, which costs about ten shillings per month for wages, and about the same amount for food-rations, is employed to a considerable extent for both, but this has been already supplemented by the labour of Indian coolies; some 6,000 Indians having been introduced upon the plantations. Upon rare occasions the produce of the cane is diminished, in low-lying moist situations, by the passing breath of frost. The average yield is about one ton and a half per acre. But under exceptionally advantageous circumstances, as much as four tons per acre have been produced in Natal. The great advantage to the sugar planter here is, that excellent land suitable for sugar may still be purchased from 4*l.* to 5*l.* per acre, which is very far below the prices in older sugar fields, such as the Mauritius, and the West Indian Islands, or Demerara. There is, probably, still in Natal one hundred times as much land that will yield sugar as has been yet cultivated. It is quite within the bounds of probability that the export of sugar may some day amount to three quarters of a million of tons, which would be some seven times in excess of the present export from the Mauritius. The sugar district in Natal extends in one direction over a stretch of 150 miles.

The coffee of Natal is of very excellent quality. Produce equal to the best from Ceylon may be realised with adequate care. But the planter in Natal has one marked advantage over the planter in Ceylon. As much as 14*l.* per ton is absorbed in the case of Ceylon for export duty, land carriage, and sea freight. There is no export duty levied in Natal; and transport and freight do not cost more than 4*l.* per ton. The cost of labour in Natal is also something less than the cost of labour in Ceylon. Coffee planting in Natal is being rapidly extended at the present time, but the

Natal plantations are yet nearly all young; and it must therefore still be held to be a question that will have to be tested by more extended experience, whether the climate and soil will allow 600 lbs. of berry per acre, which is held to be about the remunerative yield, to be produced upon the average. As much as 800 lbs. per acre have been gathered in some instances. It is also highly probable that it will be found practicable to grow coffee at higher elevations in Natal than has yet been attempted; and, if this can be done, there will be a larger extent of land available for coffee than for sugar in the colony. The present promise certainly is that Natal will become a very important coffee exporting land.

The one thing that is needed, before all else, to quicken and extend productive industry in Natal, is improved means of internal transport. On account of the steep gradients of the land there are no navigable rivers, and at the present time all heavy transport is managed by means of the sluggish, costly, and uncertain ox-wagon, at an expenditure of about two pounds of money and five days of time, per ton, for every hundred miles traversed; and even this costly method of transport is liable to be arrested for months together, in seasons when the natural pasture for the draft oxen fails. There is, perhaps, no country in the world in which it is of more vital importance to have the question practically settled whether railways may not be constructed to traverse the natural gradients and contours of a bold country, with slow rates of speed, and worked at a comparatively small expenditure. A railway in Natal, that would allow heavy traffic at from twelve to fifteen miles an hour, and that could be carried along the natural surface of the country without elaborate works, or expensive stations and establishments, at a cost of some 3,000*l.* or 4,000*l.* a mile, and that could be worked at an expense of from 320*l.* to 350*l.* per mile per annum, would give an immediate and a judicious development to the internal and essentially productive industries of the colony. The establishment of some such means of internal communication, upon a scale that will meet both the industrial and the financial necessities of the case, and that shall be fairly commensurate with the present circumstances of the colony, is at the present time under the consideration of the Natal Government.

R. J. Mann.

PUBLIC HEALTH.

Part VII.—SANITARY SUPERVISION.—CENTRAL.

If it is a relief to leave the dry domain of figures and to enter upon a short review of health authorities, some disappointment will, I fear, be experienced at the chaos of conflicting elements which make up our present sanitary regime.

One Government office will be found to give advice in matters of health without the power of enforcing it—another, to rectify acknowledged abuses, but with no authority to adopt means for their detection. Inspectors of cattle and inspectors of men are despatched from the same office, often with the same field of operations, but with no community of interests, so that the inspector of a cattle shed could not officially draw attention to the human pigsty, fever stricken though it might be, which he passed in his rounds. Inspectors of the insane, inspectors of vaccination, inspectors of the poor as regards relief of destitution and disease, inspectors or emissaries for engineering purposes, and medical officers for special enquiry concerning the public health,—all are working earnestly in their own well defined grooves, but with no central unity of plan or action.

Local authorities again—corporations, vestries, town commissioners, boards of guardians, nuisance authorities, and sewer authorities—wheel within wheel—are parcelling out the country into irregular and often conflicting jurisdictions; whilst over whole tracts of land the people are to this day left practically unaided by advice or counsel, free to engender and perpetuate disease, so long as they do it quietly and without attracting observation. It will be well, for the present, to confine our attention to the Central health supervision of the country. There are no less than five separate Governmental departments which concern themselves with the health of the people of England, though in very different degrees:—1. *The Privy Council*, through its medical department; 2. *The Board of Trade*, an offshoot of the Privy Council; 3. *The Home Office*, through its two great divisions, the Registration of Births, Deaths, and Marriages, and the Local Government Acts Office; 4. *The Poor Law Board*, an independent offshoot from the Home Office; 5. *Her Majesty's Commissioners in Lunacy;* and perhaps the War Office and the Admiralty may now be added to the list, as superintending the

working of the Contagious Diseases Acts among certain sections of the community.

1. The Privy Council.—In order to understand the functions of the Privy Council and the Home Office with respect to the public health, it will be necessary to go back a little in the sanitary history of England, and look for a moment at things as they were in 1848. The reports of commissioners appointed to investigate the health conditions of London and the great towns, appearing simultaneously with a severe outbreak of Asiatic cholera, had roused the country to the necessity of some general sanitary legislation, and in 1848, by the Public Health Act of that year, a general Board of Health was appointed for the whole country. It survived just ten years; but I am not going to follow all the changes of constitution and function which it underwent during that time, or the causes of dissatisfaction which led to its final dissolution, though much good and lasting work was done under its direction, and the names of Edwin Chadwick and the late Dr. Southwood Smith will always be associated with these early days of real sanitary legislation, as the authors of some of the most valuable reports which are to be found in the annals of preventive medicine.

My object in noticing the Board of Health is to contrast the centralising system which then existed with the present period of local responsibility in health matters; a subject deserving the greatest attention at a time when our sanitary organisation and its working is being sifted by a Royal Commission, and much hope is entertained of improvement in our health legislation. Under the Public Health Act of 1848 great powers of interference with local bodies were placed in the hands of the Central Board of Health. An excessive death-rate was quite sufficient to rouse the Central authority, and to put in action all the machinery for forcing reform on the offending local body; but it was often defeated—"many places," Mr. Tom Taylor tells us,* "resisted the application of the Act, and did so successfully. Some places prevented any provisional order being even introduced into Parliament, others caused provisional orders which were introduced into Parliament to be thrown out." The world was then very much as it is now; and men have in all times declined to be made cleanly by Act of Parliament.

By the Public Health and Local Government Acts of 1858, changes of the greatest moment were brought about. Through the almost total cessation of central control over local action, the

* Report of Sanitary Commission, 2, 68.

responsibility in matters of health was thrown upon Local Boards, popularly elected under the Acts in question. Philosophy triumphed in the return to freedom. Mr. Mill tells us that "each is the proper guardian of his own health, whether bodily, mental, or spiritual; mankind are greater gainers by suffering each other to live as seems good to themselves, than by compelling each to live as seems good to the rest." * Mankind may indeed be gainers in the eye of the philosopher, but the test of the sanitarian is of a more practical kind: he is apt to ask if lives are saved or lost, if nuisances are detected and rectified, if epidemics are controlled or allowed to run riot at will, under a free and independent government by local authorities, and a permissive legislation. I believe that any householder in a provincial town or district will be in a position to answer these questions for himself.

But to return. When the Board of Health ceased to exist in 1858, certain of its powers were transferred to the Privy Council, as being the ancient health authority of the country. The powers lately held by the Board under the Diseases Prevention Act of 1855 were thus handed over.

The Privy Council was also empowered to issue regulations concerning public vaccination; to direct enquiries and advise generally as to the public health; to appoint a medical officer, who should report from time to time and annually; and, lastly, to employ such other persons as might be necessary to assist him. The first medical officer appointed was, I need scarcely say, Mr. Simon, whose three years' previous experience, as medical adviser of the Board of Health, was the surest guarantee for efficiency and zeal in his enlarged sphere of action. As Medical Officer of the Privy Council, Mr. Simon was more than adviser; and, in 1861, at the instance of Lord Granville and Mr. Lowe, he became administrative officer for health purposes, since which time he has acted as secretarial officer, in addition to performing the purely medical duties of his office. It is Mr. Simon's high distinction that he has set no narrow bounds to the ill-defined functions of his appointment, but has stretched them to the uttermost, in the interests of scientific investigation and of the public health.

The ordinary functions of the medical department of the Privy Council may be shortly considered under the following heads:—1. Vaccination; 2. Local inquiry into the prevalence and cause of disease—(*a*) *occasional*, where special complaint has been made, or where an excessive death-rate has excited attention; (*b*) *systematic*,

* J. S. Mill, on Liberty.

with a view to ascertain the influence of certain trades and modes of life on the health of the people; 3. General scientific inquiry connected with public health matters; 4. Quarantine (so far as it is a medical question); 5. Advice generally to Government on sanitary questions.

The extraordinary functions are those which are exercised under the Diseases Prevention Act on the outbreak or threatening of serious epidemic disease.

1. *Vaccination.*—I am not now going to describe the working of the so-called Compulsory Vaccination Act, full of interest as it is, especially in these anti-vaccination times, when men throw away the experience of a century, and put forth objections which have been answered over and over again by the indisputable evidence of success. My present object is to mark the bearing of the Central authority on vaccination as a part of the public health. Under the Public Health Act of 1858, the medical officer of the Privy Council is directed to secure duly qualified men to vaccinate, and to see that vaccination is efficiently performed; to direct also the application of moneys voted for vaccination purposes, and to provide a supply of lymph. For carrying out these provisions, a staff of some 3,000 public vaccinators is selected from the ranks of the Poor Law medical officers throughout the country; a staff specially trained to the work, and acting under the Poor Law Board, but encouraged to zeal and emulation by an annual distribution of rewards based on the reports sent in to the Privy Council by its own inspectors. No less than 2,750*l.* was in this way distributed amongst 345 public vaccinators of marked efficiency during the year 1868, 129 being reckoned in the first, and 216 in the second grade in order of merit. Once in two years an examination in detail as to the state of vaccination is held in each district of England, and four medical inspectors devote themselves exclusively, or nearly so, to the task.

Turning to the supply of lymph, much that is unreasonable, more that is untrue, has been written of late to prejudice the minds of ignorant or unthinking people against Jenner's immortal legacy to mankind; the dangers of vaccination, and especially of unhealthy vaccine matter, have been paraded *ad nauseam*, and are never absent from the minds of careful mothers, whether in the upper or in the working classes. It will be a satisfaction therefore, and perhaps a surprise, to some who have given way to an unreasoning panic, to be told that a National Vaccine establishment has existed in England since the year 1808, and that it is at this time actively supplementing the lymph supply of the country, under the eye of a resident inspector, by whom the most minute particulars are recorded of the source

and efficiency of each sample supplied. The post is no sinecure, for the eleventh report of the medical officer of Privy Council informs us that no less than 131,000 charged ivory points, 1,059 charged squares of glass, and 9,792 charged capillary tubes, were, in answer to 14,099 applications, distributed to the various districts in England during a single year. No pains are spared to secure lymph of the best quality and vaccinators of the highest efficiency; but much remains to be done, if vaccination is to be the rule and not the exception among rich and poor. The medical officer of the Privy Council does indeed remonstrate where deaths from small-pox are excessive, and where attention has been drawn to an outbreak of the disease through the tables of mortality; culprit towns appear in the "black page" of each annual report; but deaths from small-pox are a sorry test of the extent of vaccination in a community.

The town in which I reside was last visited by an epidemic of small-pox in the year 1865. Two deaths only have occured since that date, one in 1868, and one in 1869; yet it would appear that scarcely one-third of the children born in the past year are protected from the scourge, or bear the badge of safety on their arms.

Little short of 700 parents of children born within a year (the average birth-rate being about 970), were reported by the Registrar to the Board of Guardians (not to the Town Commissioners—the proper health authorities), as having omitted to return any certificate of successful vaccination, as required by law. Many of these children are doubtless vaccinated, but the fact remains, and these returns are available for Mr. Simon. It is possible that, in his hands, they might find a better use, and a more fitting destination than the waste paper basket of a union workhouse.

E. T. Wilson.

[to be continued.]

A homely, but apparently most useful, method has been communicated to us for disinfecting houses and rooms, in which cases of scarlet fever have occurred. Dissolve saltpetre up to the point of saturation, and in the solution soak several sheets of coarse blotting paper, which must be allowed to take up as much as they can, and afterwards dried. Carefully close every door, window, and chimney of the affected room, and let the prepared blotting paper be lighted and smoulder itself out. This is, of course, not intended to supersede the use of Condy's fluid, the value of which in every household where there is sickness is sufficiently well known; but we have heard of such success in checking the spread of infection by means of the saturated paper, and it is moreover so easy of trial, that we gladly publish the information sent to us.

AFRICAN FOODS.

GIGANTIC MUSHROOMS.

In an interesting account of the Pedras Negras of Pungo-Andongo, published in the "Journal of Travel," Dr. Welwitsch, the Angolan explorer and botanist, incidentally mentions having met with a mushroom of enormous dimensions. He says, "among a great number of interesting cryptogamic plants, I shall only mention a gigantic agaric which I found growing in the neighbouring Panda woods, distinguished by the immense size of its head, which sometimes measures more than three feet in circumference, as well as by the delicate flavour of its flesh."

Wishing to know something more of this extraordinary vegetable production, we turned for information to Dr. Welwitsch's description of the fungi collected by him, the first part of which has appeared in the Transactions of the Linnean Society, but found that it had not reached the agarics. We thereupon applied to our friend, who, with his usual kindness, readily told us all about it; and, as it is of especial interest to the readers of the "Food Journal," we have asked and obtained permission to repeat his information. It appears that on a botanical expedition in a district called Calungembo, near Pungo-Andongo, his provisions began to run short, and towards the close of a day's ramble he came upon some of his men carrying one of these enormous mushrooms home to camp for supper. He had not himself previously met with it, but the natives had; and the short commons on which they found themselves had sharpened their eyes and led to their picking it up. Some idea of the size of this specimen may be formed from the fact that that single mushroom made soup sufficient to feed his party of twenty. It was as large as an umbrella. Subsequently he met with it repeatedly, and also found that it was familiar to all the inhabitants, a few being regularly, or rather irregularly, brought to market during the season, at the presidium of Pungo-Andongo, where they were sold at 1*d.* to 3*d.* a piece, according to size. The natives usually brought them, one or two hanging at each end of a stick, carried Chinese fashion over the shoulder. It is a true agaric, as yet undescribed, but which we hope will not long remain so.

A. Murray, F.L.S.

THE WAR AND OUR FOOD SUPPLIES.

WHILST all eyes are directed to the tremendous conflict which has so suddenly converted what was a scene of peace and progress into a theatre of war and devastation, there is one thought which must needs agitate the public mind in this country, viz., how will it affect our supply of food—shall we have much difficulty in obtaining whatever quantity we may require? Doubtless, ever since the introduction of free trade in corn, we have learnt to depend very greatly on imported grain. Proportionately as we have realised the advantages of an international division of labour, under which each nation gives itself, undistractedly, to the production of what is most indigenous to its soil and climate, and most congenial to the skill and industry of its people, we have given ourselves to the growth at home of what could not so easily and cheaply be brought from abroad, and have trusted implicitly to always having the markets of the world open to us for the remainder. But what if such markets should be closed to us by war? What if the most important corn shipping ports should be blockaded? This would indeed be a severe contingency; and yet this is almost our position now that, whilst we are likely to require a large quantity of corn to make up for a short harvest, we may find our usual supplies cut off by the blockade of the German ports, the distraction of Belgium, Holland, Sweden, and Denmark, and the straitened circumstances of France. This is a serious question which we are now summoned to consider; and, premature though it be to hazard any speculation, it is well to have the facts of the case distinctly before us.

Taking one year with another, the consumption of wheat and wheat flour in the United Kingdom is assumed to be at the rate of 5½ bushels per head, and therefore for 31,000,000 of people, the quantity required is 21,000,000 quarters. Of this quantity two-thirds are usually produced at home, and one-third abroad. Last year, for instance, there were 3,700,000 acres sown with wheat. Assuming that we shall yet gather a fair average crop, that is, about 30 bushels per acre, the home growth may be expected to be about 14,000,000 quarters, making us dependent upon foreign supplies to the extent of 7,000,000 quarters. We must remember, however,

that whilst the consumption may be greatly affected by the probable scarcity of meat, the home production is subject to grave eventualities, both in the number of bushels per acre, and more especially in the weight of the bushel; so that, till the very last moment of the harvest, we cannot tell how much we shall really want. Taking all into consideration, we fully expect that we shall require this year at least ten million quarters of wheat and wheat flour.

Looking back to our imports, we find them assuming larger and larger dimensions. Thirty years ago our average importation was only 500,000 quarters; twenty years ago it was about 2,000,000 quarters; ten years ago it amounted to 5,000,000 quarters; and recently it reached 10,000,000 quarters, the average importation of the last ten years having been 8,000,000 quarters; and yet the prices have not been very high. The average price of wheat for the last ten years was 51*s.* 8*d.*, the highest having been 57*s.* 5*d.*, and the lowest 45*s.* A rise of 10*s.* or 12*s.* a quarter seems to have been sufficient to bring to our market whatever quantity we required. In truth, with free trade, we need not pay extravagant prices; 60*s.* or 70*s.* have been the maximum during the last ten years, whilst even 40*s.* or 50*s.* a quarter have been sufficient to bring over 6,000,000 to 7,000,000 quarters of wheat. And whence have we derived our main supplies? Happily not from countries immediately affected by the war. In 1869 the imports of wheat and wheat flour were from the following countries:—

Imports from	Cwts.	Per Cent.
France	2,153,000	.. 5
Prussia	4,967,000	.. 11
Germany	2,266,000	.. 5
Russia, Sweden, and Denmark	2,677,000	.. 6
Other Countries	32,354,000	.. 73
	44,417,000	.. 100

Only a small proportion, therefore, of our supplies of wheat came from Prussia or France. The southern ports of Russia, Illyria, Croatia and Dalmatia, Wallachia and Moldavia, the United States, and even the North American colonies, have been our principal resources. France, though a large wheat-growing country, needs it all for herself. Italy is in the same position. If there be any danger then in our present circumstances, it does not arise from the blockade of a few German ports; nor need we fear that war will tend to increase materially the consumption of wheat. Doubtless no one can attempt to provide for millions of men in any one locality without causing an immense waste of articles of food. It should be

observed, however, that in Germany very little wheaten bread is, at any time, eaten by the people, rye bread being very general; and we fear that the soldiers will not fare better; and in France though the army may consume more, the people at home will consume less from want of means. Altogether our prospects for the supply of bread are by no means unsatisfactory, especially when we learn that the United States, Russia, and other countries have been blessed with an abundant harvest. What we have really to deplore are our prospects as regards barley and oats, which are decidedly scarce at home, and are usually imported in large quantities from the north of Europe. But the ports of Russia, Denmark, and Sweden, are likely to continue open, and much of the Prussian produce may come to us through those channels. Should then our requirements not prove extravagant, and the supplies continue to flow in from neutral countries almost uninterruptedly, we cannot expect prices to rule very high. Let it not be imagined that war must of necessity have a considerable influence on prices, from the fact that a considerable amount of money is expended in food and other purposes. Money has no such power. Mr. Tooke, in his "History of Prices," compared the average cost of wheat in times of war and in times of peace; and, continuing the comparison to the present day, the following interesting results are obtained:—

Average Price of Wheat per Quarter.

War Periods.

1688—1697	10 years war	£2	2 6¾
1702—1712	11 „	2	2 0
1740—1748	9 „	1	11 6½
1755—1762	8 „	1	17 1¾
1775—1782	8 „	2	6 6½
1793—1800	8 „	3	8 0
1801—1814	14 „	4	9 0
1854—1856	3 „	3	12 0
Average of	71 „	2	14 0

Peace Periods.

1698—1701	4 years peace	£2	6 0
1713—1739	27 „	1	15 10¾
1749—1754	6 „	1	13 11½
1763—1774	12 „	2	8 11½
1783—1792	10 „	2	10 2¼
1815—1853	39 „	2	19 0
1857—1869	13 „	2	14 0
Average of	111 „	2	10 0

The difference between peace and war is therefore limited to 4*s*. per quarter, and that was mainly produced by the excessive prices

FOOD NOTES FROM RUSSIA.

A Blue Book, containing various reports on land tenures, furnished by our Consuls, was recently presented to Parliament. Embedded in the mass, we have found certain items of interest as to the dietary of the peasants of foreign countries, who are usually believed, as Mr. Howard said, to starve on "black bread, broth, red herrings, and such like." The English prejudice, foolish as it is, in favour of white bread, would scarcely permit the description of the food of the Swedish peasant proprietors as "substantial." It consists chiefly of coarse, hard rye bread, sometimes mixed with barley or oatmeal, potatoes, fish, rye, barley, or oatmeal porridge, cheese, milk, salt meat, and herrings; fresh meat is a rarity.

The Finlanders do not fare so well. Their food is salt fish, sour rye bread as hard as flint, potatoes, milk, and very light beer. The diet of the peasantry of Great Russia is thus graphically described by Mr. Michell:—"On rising, the Russian peasant will eat a hunch of black rye bread and a bowl of milk or curds; but his principal meal, at noon, consists generally of cabbage or mushroom soup, of which meat is seldom the basis; of baked buckwheat, eaten with milk, oil, or butter, according to the means of the family; and of an unlimited quantity of bread. Potatoes are not a staple of food, except in the vicinity of capitals, or in the neighbourhood of German colonists, who have taught the Russian peasantry around them to overcome their prejudices against the cultivation of "the devil's apple;" the introduction of which, at the commencement of the present century, led to serious agrarian riots in the provinces of the Volga basin. The drink is mostly water; a liquor made of fermented rye, called kvas, and small table beer, being only found on holidays, in the houses of the richer peasantry, and that principally in the northern and industrial provinces. Spirits are not consumed at meals, but only on occasions when the peasants' object is to get merry and drunk. These occasions present themselves on holidays, of which there are 115 during the year. The bowl of soup, the pot of buckwheat, and the loaf of rye bread, are again placed on the table for supper.

It is not, perhaps, so much poverty as the discipline of the Russo-Greek Church, that compels the Russian peasant to take but little nourishing food. On about 210 days in the year he is not allowed to eat meat; and although sick persons, and women for a short

time after child-birth, can obtain dispensations, they seldom avail themselves of the power, clinging superstitiously to the severest forms of fasting, and that in a climate which requires a more than average consumption of animal food. The loaf of rye bread, it is true, but seldom fails the Russian peasant family, except in years of famine or exceptional distress; but at least half of the infant mortality in the agricultural districts is referable to the inability of the mothers—fed on sour rye bread and cabbage or mushroom water, worn out with excess of fasts and defect of sleep—to nourish their infants. Mr. Giliasofsky, a Russian priest, gives a piteous account of the babes of less than a year old left by themselves for twenty-four hours, with feeding bottles fastened to their hands and feet containing curds and water, or gruel mixed with water or even kvas; or perhaps a poultice made of rye bread, oatmeal, or curds, is laid upon their mouth, a method which naturally often results in suffocation.

The following table, compiled from actual account books, gives, in English quantities and value, a tariff and estimate of the diet of Russian agricultural labourers, on a large scale, and under liberal management, and therefore under the most favourable circumstances:—

Annual Consumption per Man:

Description of Victual.	English Weight.	Value in Eng. Money.
Flour—Rye	451 lbs.	£0 19 0
„ Wheat	421 „	1 6 7
Grits—Buckwheat, etc.	5¾ bushels	0 4 9½
Peas	30¾ lbs.	0 1 1¼
Oil and Butter	17½ „	0 4 6
Salt	32½ „	0 1 4¼
Meat	117 „	0 13 2
Fish and Cabbage	1¼ „	0 0 9½
		3 11 4½

Thus, a Russian peasant, when most favourably situated, will get 12 oz. meat, principally in soup, on 155 days in the year, and 2 lbs. 6 oz. of bread and flour, besides buckwheat, peas, etc., at a cost of 2½*d.* per diem; while the quantity of flour consumed by these agricultural labourers may be taken as the average consumption of corn per head in the villages, with, however, the difference that the relative proportion of wheat will be smaller by two-thirds. Taking all the provinces together, the quantity of meat will average, in the same districts, only one half the quantity shown in the estimate. In the capitals the cost of feeding servants is reckoned at about 20 kopecks (6*d.*) per head per diem. One of the greatest inducements to the peasantry, in the less favoured provinces of Russia, to seek work in towns or on railways, is a prospect of obtaining a sufficiency of food. For the first month after joining a contractor's gang the labourer literally gorges himself with food, and the con-

tractor provides for such voracity, knowing that the quality of the labourer's work will depend upon his acquiring the physical power, which he seldom brings with him from the village.

A pleasant contrast to the melancholy picture thus sketched is afforded us by the diet of the industrious and thriving peasantry of Hesse and Bavaria. In the commune of Viernheim, on the right bank of the Rhine, six miles from Mannheim, the peasant eats five times a day. In the morning, on first getting up, he usually takes coffee with milk and sugar, and eats bread; the parents and younger children each get a small white loaf of wheaten flour—the rest brown bread, half rye, half barley: where the household is not well off, a soup made of flour, milk, and boiled potatoes takes the place of coffee and bread; coffee is, however, the rule. The peasant takes to his work with him bread, and sometimes cheese, which constitutes his second breakfast, and is eaten between 8 a.m. and 10 a.m., with a small quantity of corn brandy. At 12 o'clock he returns home to dinner, which consists three times a week of meat, viz., salt pork and potatoes; and twice a week Sauer-kraut—in the summer, vegetables and a great deal of salad, dressed with vinegar and rapeseed oil. On Sundays he eats fresh meat—usually corned beef—first in the form of soup, then the meat from which the soup has been made. On the days on which meat is not eaten the potatoes and vegetables are supplemented by a pudding, of which flour and milk are the principal ingredients, with butter and eggs according to circumstances. In the afternoon he eats his so-called vespers—bread and coffee, with, in summer and autumn, fruit in large quantities. At night he concludes with supper, consisting of a soup of milk, flour, and boiled potatoes, or potatoes, butter, and cheese, or potatoes and salt meat. The salt pork is cured at home, each family having one or more fat pigs killed in winter. On fête days a large cake is baked, which it takes several days to consume. The staple of his food, however, consists of potatoes and bread, the daily allowance of the latter being from 2 lbs. to 3 lbs. for a man, and 1½ lb. to 2 lbs. for a woman. At home he drinks nothing but his daily quantum of corn brandy—about a gill—neither very strong nor very palatable, except on Sundays, when he has beer; but he often goes to the public house, and drinks three or four glasses of beer, at 3 kreuzers (1*d.*) per glass. Wine is only drunk on fête days, notwithstanding the vicinity of the wine-growing country. The labourers generally use goats' milk instead of cows' milk; and, of course, have to depend chiefly on potatoes and bread, which are plentifully supplied.

E. Wade.

POPULAR FOOD ANALYSIS.

No. 8.—TEA.

What an insignificant little monosyllable is the title of the present article; but what a wide-spread and important article of human consumption it represents!

Offered, in 1664, as a rare and curious gift to the then Queen of England, it forms, in 1870, the essential portion of the most comfortable meal of the day in the poorest household. It pervades and influences every class of society, and each individual member of the population. What our great-great-grandmothers, and the single ladies of their period, did without that invigorating element at all all their parties, is a speculation too deep to enter upon. Even as we write, we feel the talkative influence fast overcoming us; and therefore our readers must excuse our being more than usually discursive in treating of the history and preparation of so useful a beverage.

Tea is made from the leaves of the *Thea sinensis*, a plant of the natural order of *Columniferæ*, and largely cultivated in China, India, Japan, and the Eastern Archipelago. At what period the use of tea first became established in China is probably not a well ascertained fact; but we have two descriptions of its origin by Chinese writers. The first is a legend believed in by the religious portion of the community in China, and is as follows:—"A pious hermit, who, in his watchings and prayers, had often been overtaken by sleep, so that his eyelids closed, cut them off in holy wrath against the weakness of the flesh, and threw them on the ground; but a god caused a tea shrub to spring out of them, the leaves of which exhibit the form of an eyelid bordered with lashes, and possess the gift of hindering sleep. When the hermit had tasted and proved the shrub, he taught the use of it to his fellow men."

The second description of the origin of tea is given by a Chinese *literatus*, writing in 1693, in which the author ascribes the origin of the use of the tea plant to a dweller on the mountain of Sung-lo-shan, a hill in the province of Kiang-nan, about 3,000 ft. in height. He says that "a Bonze of the sect of Fo taught a Kiang-nan man, named Ko-Fy, the art of making tea, and thus it was called Sung-lo tea. The tea speedily gained great repute, so that the Bonze became rich, and abandoned the profession of priest. The man is gone, and only the name remains. Ye men of learning and travellers who seek real

Sung-lo tea, may now search in vain. That which is sold in the market is a mere counterfeit." But though Sung-lo-Shan is now destitute of tea, the beautiful and fertile Moyune tea district is close by, on which the mantle of the genius of the mountain seems to have descended; for it is here, in a deep and porous soil, with a fine natural drainage, that the most *recherché* green teas are produced. The *Thea viridis*, or green tea shrub, delights in elevated situations, and in a temperate climate, both of which conditions seem necessary to the production of the delicate flavour required. The *Thea Bohea*, or black tea plant, on the other hand, requires a southern aspect, and a more tropical sun, which seems to have the power of inducing that great astringency so prized in good black tea. The principal Chinese districts in which the latter shrub is grown are Woo-e-shan, Hounan, and Hupeh. The tea from the first named locality is very fine, but it scarcely ever reaches Great Britain, as it is all absorbed for the use of the Chinese court and upper ten thousand, its production being the tribute on condition of paying which a large number of priests have permission to live, and carry on the worship of a demi-god called Woo-e. The shrub grows in Woo-e-shan, in a brown loam, consisting of rock detritus and vegetable remains. The teas from Hounan and Hupeh are the ordinary Moning and Kaisow qualities which annually pour into our markets. They are here grown on a richer and more moist soil, which, together with an increased average temperature, serves to make the yield of leaves much greater; but this result seems to be obtained to some extent at the expense of flavour. The importance of the tea trade in China has caused the cultivation of the shrub to be most carefully looked after, and it may possibly interest our readers to have some particulars of how it is managed. The admirable series of "Jottings from the far East," by Mr. Cochran, in which he details the results of his personal experience in the tea districts of China, enables us to give a very minute description of this branch of husbandry from the most modern authority. In the month of October the seed is gathered, the larger and more perfect specimens being laid aside for the nursery, whilst the remainder is subjected to pressure in order to obtain a limpid oil, which, when purified, is in much request among the wealthier classes, for certain refinements in their cuisine. With the view of preserving the seed during the rigour of winter, of shielding it from the ravages of insects, and of maintaining it in a condition likely to encourage and accelerate germination, it is kept in clay pots filled with alternate layers of moist earth and sand, carefully covered up, and placed aside in a warm

and sheltered situation. When the earliest glimpses of sunshine usher in the spring, the pots are moved into the open air, and on the first favourable opportunity in February, the seeds are sown in a prepared corner of the farm, sheltered by bamboo copses, where they remain for a year. At the end of this period, the shrubs are twelve inches high, and are fit to be transplanted. Should it be necessary to fill up blanks in the nursery, or in the bearing plantations, and a sufficiency of young plants not be available, several seeds are dropped into a hole made for their reception, the farmers having learned not to rely on the germination of a single grain. In both nursery and garden, it is considered necessary to provide a considerable depth of soil, as the young shrub projects a long tap-root, any injury to which in its early stages militates against the subsequent vigour of the bush. When the young plant appears above the surface, every care is bestowed to guard against the ravages of insects, and ward off the rude blast; whilst the main stem is cropped from time to time, so as to stunt its upward growth, and encourage the formation of lateral branches. Abundance of leaves being the object desired, every plan is adopted to obtain this result. When the bush has attained the height of about four feet (usually after three years' careful attention and pruning) it is considered fit to be included in the first leaf harvest; during these years no crop is gathered, the leaves being permitted to mature and wither on the plant. Having passed its third year, the leaves are gathered at the proper seasons. In China, as in Britain, April is a month of showers, during which the bushes throw out their second flush of young verdure. Directly the rain has given place to sunshine, and drying winds have chased each leaflet's tears away, the little leaf-gatherers sally forth betimes, singing and laughing as they skip and dance to their pleasant employment. By daylight hundreds, sometimes thousands, of pretty black-eyed, black-haired young damsels may be seen, tripping along the narrow footpaths that separate the paddy fields, towards the garden among the hills; and, when the mid-day gong sounds, they squat in merry groups among the bushes to eat their frugal meal of rice, moistened by copious draughts of hot weak tea. It is not without reason that the little pluckers are for a time debarred the use of stronger and more flavoured food. Such is the delicacy of the young leaf, that extraordinary precautions are deemed necessary in order to prevent any deterioration, and especially that no objectionable taint may be communicated. In furtherance of this object the girls are required to have undergone a species of training and purification immediately prior to the commencement of the harvest.

For several weeks previously they live only on such diet as may communicate no offensive odour to the skin or breath; and, whilst engaged plucking the flowery Pekoe, are occasionally required to wear gloves of perfumed leather. Although every leaf is picked separately, such is the dexterity conferred by practice that expert pluckers can easily gather twelve pounds weight per day. As the season advances, many of the leaves become stronger and coarser; and, as it would kill the bush to remove all its foliage at each plucking, the bulk of the tea harvested in March is, as a rule, slightly inferior in flavour to that previously obtained, although, from its greater maturity, it usually possesses more strength. During May and June there is a marked difference in the crop, the colour of the manufactured tea being of a darker shade, and the plucked leaves rather leathery, large, and coarse. From the middle of March to the end of June may be said to comprise the leaf harvest, which is divided into three seasons, corresponding to the result of three great general pluckings coming between the rains. It will be inferred with truth that the most expensive teas are made from the earliest leaves, and likewise that their yield is limited in quantity, although usually possessed of exquisite flavour, if deficient in strength. The second season's teas are not so flavoury, yet, having arrived at greater maturity, and having, as a rule, been more carefully manipulated, are probably of greater value, and form the largest proportion of the whole produce. The third crop necessarily contains many partially withered leaves, deficient in aroma; and, although they produce a bitter infusion at the first maceration, they yield in reality less soluble material to boiling water than their predecessors. With the plucking and sun-drying of the leaves the farmers' responsibility may be said to terminate, as the emissaries of the manipulator are usually on the alert to receive the produce from the sheds, pack it loosely in bags, and convey it to his hong. Arrived at the hong, the dried leaves have now to be manufactured; and the process differs to some extent according as it is desired to make green or black tea.

Before, however, proceeding to the actual details of manufacture, it will be well to explain the meaning of some of the technical terms which must be employed. With the view of thoroughly illustrating our meaning, we present the reader with some drawings from nature, made expressly for the Journal by Mr. Cochran. At Fig. 9 will be found the leaves of the China tea in their various stages of maturity, while at Fig. 10 we see the Indian tea shrub similarly illustrated. Figs. 11 and 12 show the same leaves after having been manufactured into black tea, and infused in the usual

manner. A study of these illustrations will afford, to those of our readers who care to examine their tea, the means of recognising the genuine leaves from those of adulteration. As the best and simplest way of explaining the plates and technicalities, we put the whole into a tabulated form.

Description of Maturity of Leaf.	Name in Green Tea.	Name in Black Tea.	Letter in Illustr'n.
1.—The earliest bud	Young Hyson ..	Flowery Pekoe ..	*a*
2.—The partially expanded bud ..	Gunpowder ..	Orange Pekoe ..	*b*
3.—The earliest leaf	Hyson	Pekoe	*c*
4.—The half matured leaf	Imperial	Souchong	*d*
5.—The matured leaf	Twankay	Congou	*e*

Young Hyson and Flowery Pekoe are of course the most valuable and delicate teas, while Twankay and Congou are the least expensive; although lower qualities exist than any named in our table.

Let us first suppose that we are witnessing the preparation of green tea. It being quite exceptional to meet with a tea-farmer who is likewise a manipulator, the sun-dried leaves are often conveyed many leagues; but the further they are removed, and the longer they remain in the unmanufactured condition, the more likely they are to deteriorate. Under favourable circumstances the leaves usually reach the pans within two hours after being plucked. The pans are half filled, and the heat so regulated as to increase very slowly, yet not beyond a point which would prevent a workman using his bare hands. Keeping the leaves in constant motion for five minutes, he scoops out the whole with a curved porcelain implement into a bamboo basket, transferring its contents to the rolling table or frame, around which several manipulators are seated. The first grasps as many leaves as his two hands can contain, which he works into a ball, employing all the pressure at his command, and rolling the mass about on the tables at intervals. It is then passed on to the next, who gently bruises it, rapidly twisting each leaf between the finger and thumb of both hands; alternately rolled, then disintegrated and retwisted, the ball passes from one to another round the table, and is finally rubbed between the palms of the last workman's hands into a shallow vessel, which when full is once more emptied into the heated pan. At the second roasting the charcoal fire is partially smothered in ashes, in order that a minimum heat may be evolved, but the leaves are not permitted to remain a moment quiescent. Thus far they are still moist, soft, and slightly glutinous to the touch, so that they readily retain much of the configuration or twist imparted by the dexterous fingers of the manipulators. At this stage the superintendent going round the pans and tables decides what further treatment the contents of

each shall undergo; the larger leaves, according to quality, being again rolled with a continuous circular motion on the tables, so as to produce Gunpowder, Imperial and Twankay; whilst the younger, smaller and finer, which meanwhile have been rapidly picked out by boys, are twisted leaf by leaf several times, into Young Hyson, Hyson, etc. During the interval the furnaces are livened up, and the pans heated to a point short of redness. For about an hour their contents are roasted, but kept in continual motion. When no more vapour rises, and the leaves have assumed a fixed, dull green, they are considered safe from fermentation if kept from the damp, and may be permitted to remain unfinished for twenty-four hours, or till all the plucking on hand has been similarly treated. The following morning the tea is passed through a winnowing machine, and afterwards through graduated sieves, which finally determine the qualities. Each sort, carefully kept separate, is again roasted from one to four times, the colouring pigment being applied before the second last firing. Formerly the facing powder was composed of chunam or native lime, and Prussian blue, but an innovation has found favour in the shape of a mixture of extra-calcined chunam and finest soft indigo, modified as occasion may require by the use of turmeric. Doubtless this change is referable to the injurious effects on the constitutions of green-tea drinkers which European writers ascribed to the use of Prussian blue; strictures with which the large tea merchants and native brokers could not fail to become acquainted during their frequent intercourse with foreigners at the various treaty ports.

The powder being in readiness, the workman scatters it in the form of impalpable dust over the contents of the pan, in the proportion of about one ounce to fourteen pounds of tea; he then thoroughly manipulates the whole with his hands till the colour is equally distributed, taking care that during the operation, the furnace fire is damped. Five minutes usually serve to complete this operation. During the various stages, two boys attached to each workman have been busy picking out all coarse leaves and stalks which may have escaped the sieves. This they accomplish with the utmost dexterity without in the least retarding progress. The next step sees the tea conveyed to the picking and classifying room, where it is carefully gone over by females. From this chamber, after a final roasting, it is removed to the packing room, which is maintained at a high temperature; the classes are separately bulked and packed in a hot condition, when the packages are immediately soldered up ready for exportation.

J. Muter, Ph.D

[to be continued.]

SCIENCE AND ADMINISTRATION IN RELATION TO OUR RESOURCES.

The appointment of a Government Commission to consider the relations of science to the State offers an opportunity for further reviewing the conditions of our administrative arrangements, and the means by which they may be made available for greater production and greater economy. This is the more essential because we may, in demanding public co-operation in the provision of food, and in the maintenance of the public health, be met with the objection that we impose heavy burdens on the Treasury; whereas, what is required may be best furnished by a proper application of the present resources.

It is from the unsystematic condition of our scientific departments that we waste power. In fact, we do not know what the State does for science, and the Commission renders a great service in informing us. For this Colonel Strange has laboured for years, and he will have attained something if he finds out how much public money is spent for scientific purposes, and what we get for it. It resolves itself into turning the brain power of the public service into account, into economising those national resources of mental energy which are as truly elements of our strength and our power as beef, mutton, rifled cannon, or armour plates.

In one sense the Government do nothing for science, while in another they do a great deal. They spend very much money, and they give the public but little for it. What is spent for chemistry alone is something considerable, and yet we have no public laboratory of a satisfactory character—nothing that can vie with the Prussian establishments—no provision for the pursuit of higher and original researches, which are the ultimate and genuine sources of practical progress. Who can dare to say what, in the world of science, is a toy, and what the element of a manufacture? Spectrum analysis was once the occupation of the speculator, but it is now one of our most refined and most assured tests, and the properties of light can effect minute and assured determinations of the greatest value. The theoretical investigations of the earthy bases have at length given us, in aluminium, a metal, the peculiar properties of which are of commercial and mechanical value. The philosopher's theory or mathematician's computation leads the way for the chemist's experiment; the analysis, costly in its beginning, becomes cheaper and

more assured at each repetition. A philosophical toy is produced for the entertainment of the wealthy; its production is the work of the manufacturer; the conditions of industry are involved; capital and labour exercise their functions to sell more toys, and to sell them cheaper; a larger plant and a better sub-division of labour become necessary; toys are produced and cheapened with each greater range of production, as they are made available for millions of children. The children's toy in the hands of the mechanic becomes an appliance for some branch of industry. There is a demand for some ingredient or material; commerce is enlisted to seek throughout the earth a cheaper or more abundant supply. Thus what could only be furnished as a luxury, at the prices of luxury, under the combination of the whole organisation of a highly advanced society, becomes an ordinary appliance available for the common uses of the world at large.

Chemistry, therefore, in its highest, and, it may be said, its most theoretical investigations, is most justly to be cultivated by a nation. In an ordinary sense the resources of a nation lie in the growth of its soil, as well as in the minerals which the soil contains, and likewise in the fish of its rivers and of its seas. Holland, limited in its soil, and destitute of minerals, sought in fisheries and in whaling other materials for wealth, which have been the foundation of her shipping and carrying trade. It was, however, by the applications of science that Holland, in a less progressive age than this, endowed herself with further resources and constant employment for her population. By a better application of politico-economical doctrines she enlisted skilled labour, favouring the persecuted; she attracted capital, protecting the Jews; she raised her public and private credit as an assured means of providing herself with wealth. Holland, by free trade in corn, was the entrepôt of Europe, and became the great money market. By the prosecution of chemical and mechanical studies, then favourably fostered by the possession of the great book and publishing market, Holland promoted every branch of manufacture, acquiring a supremacy over the world in many departments.

If Holland has no longer the monopoly of these advantages, it is because the great war fell heavily upon her; and that other powerful nations, particularly our own, are engaged in the same career, leaving Holland only a minor share. Here, however, we have a country, small, and with the narrowest natural gifts, which has maintained a dense population by the application of the mental powers of her people. We cannot omit the promotion of schooling, in which she was one of the first; and a diligent economy in

the distribution of her means, which particularly included a due provision for the poor. Among the resources created by Holland, various chemical manufactures, or those in which the physical sciences are concerned, are to be enumerated.

The necessities of Holland have enforced this rigid economy of mind and of matter; but, if we are richer, we are not exempt from the like exertions. Our soil is now insufficient to provide food for our people; but its underground produce in coal, metals, and salt, greatly helps us. The fisheries are made tributary; but since the bounties have been abolished, they have scarcely been fostered with due diligence by the Government. The abandonment of a vicious system of bounties does not involve the abdication of the duty of the community to give judicious co-operation. The toiling fisherman cannot of himself create fishing harbours—this requires a higher combination—and, although the Government has assisted, it has been grudgingly, and without the ardour of an enlightened administration. There are duties which are individual, and may be performed by an individual without reference to the community; but there are duties only to be performed by association—by the action of the community in a greater or less degree. It is here that we are deficient. Many are the resources of which we have been deprived in the past, and of which we are deprived in the present, by this neglect of public action.

Private enterprise has of late extended our coal fields, and worked new iron districts. The benefits of these increased supplies are very great, but they should have been earlier enjoyed. If some men of science maintained on fair grounds that the coal formation underlapped beyond the old recognised bounds, it was worth while for the nation to put down trial borings, either at its own expense, or by offering a bounty to any landowner or colliery company that would make the venture. There has been a gain to individual landowners from new pits, but this is altogether apart from the national advantage,—the advantage to the manufacturer, who has set up new establishments; to the labourer, who has found employment in these; to the householder in London, who has obtained more and cheaper fuel. There is, in fine, no administration to discharge an evident public duty. There is a school of mines, which is a school; there are mining inspectors, but there is no administration which could have promoted trial borings—none which would have enabled a railway or tramway to be made to the new pit without unjustifiable impediments from the landlords or antagonistic companies; no authority to prevent vexatious assessments, and protracted litigation carried on by farmers with

the parish purse; no one, even, who could ensure for the labourers convenient cottages near their work, and schooling for their children. Our progress has gone on without such assistance, in defiance of the obstacles which it might have removed; but attended often by bankruptcy, strikes, pauperism, ignorance, and crime, because we have no scientific organisation and no administration to promote the national well-being.

We therefore especially urge on the Commission that its deliberations shall not omit the application of science as a means of production. We live in times fruitful of great events, but attended with great dangers; and while we have been exposed to a keen commercial competition, we may yet have to encounter all the difficulties of hostile rivalry. In the great war, the French, blockaded by sea and secluded from maritime commerce, equally under the direction of the republican government and of Napoleon, set themselves to provide substitutes for foreign productions from internal resources. The Government employed men of science in investigations; they encouraged chemists and mechanics. It was during the war that they established a manufacture of saltpetre, that the beet-root sugar industry was promoted, and the Jacquard loom was put in operation. No needful expense was spared, while the main energies of the country were devoted to war; but, year after year, the scientific industry of the country was unremittingly pursued, and at a very small cost after all. If literature did not thrive under the repressive domination of the empire, yet science flourished, and the most illustrious names gave it distinction, and were left as an endowment to France—a productive inheritance after the defeats and disasters of Moscow, of Leipsic, of Toulouse, and of Waterloo.

We must be prepared for peace and for war; and for both conditions we must increase our warlike resources, more particularly by the cultivation of peaceful pursuits. It has been the development of our iron trade, and the formation of vast engineering establishments, which has enabled us to create the immense and titanic apparatus of modern war. The steam hammer, and the roller, designed not as instruments of hostility, enable armour plates to be forged, for which a general might wish, but without their aid could never obtain. We have of late years felt a confidence as to military preparation beyond the numbers of our population or the limits of our enrolled army, because we have such vast civil appliances that we can even discuss the propriety of closing our dockyards and our arsenals. The progress of war material has been greatly advanced by the experiments of Wool-

wich and Shoeburyness, accomplished at a large expenditure; but if we think how much more might have been done for this department, and for every department of our industry, by a small and judicious expenditure on general science, it is almost painful to realise what is conceded to the necessities of war, and what is denied to the constant demands of the well-being of the people.

We should be stronger, even as a military nation, if by scientific appliances we grew more corn, or fattened more beef and mutton; we should be stronger in having men to fight, than even in possessing weapons which we have not men to handle. It is now acknowledged on all hands that our agricultural chemistry and mechanics have done much to augment our consumable produce, and it has been fortunate that in these respects private enterprise and organisation have been adequate. The results have been of the greatest value to the community, but the community has not co-operated in their realisation; while, if help had been wanted and not afforded, we might still have waited for what we have acquired. There is a stolidity which is derived from habitual pauperism, and so it happens that some persons have got to regard our neglect as legitimate and to be canonised, while they condemn as illegitimate any effort in the other direction. In countries where there is a heavy excise on salt, and consequently the greatest pinching in its use, there will be found proverbs and superstitions, not only adapted to favour economy in the employment of the substance, but even representing it as unwholesome. In England, it would have hurt no agricultural show or farmers' club, if we had had a Minister of Agriculture, who could have urged on his colleagues and the legislature the removal of any injurious impediment and obstruction—who could have favoured exhibitions, colleges, professorships and experiments, by legislative measures, or by a small and judicious expenditure. Had there been such a Minister, even to reward and encourage the deserving, progress could not have been impeded, but might have been much stimulated. Sir Wm. Armstrong and Sir Joseph Whitworth, or their compeers, might then have been knighted for agricultural improvements.

If there had been a Minister of Agriculture, he would have sought where in the departments of the State he could have obtained co-operation and assistance. If we have a Minister for the department of Science, a Minister of Agriculture will find one colleague who can obtain for him the most essential help. The State directly and indirectly spends large sums upon chemistry; there are professors, there are laboratories in public departments and in colleges. Let these be utilised. By organisation we should have

men for original and higher studies, men for teaching, men for analyses, a better arrangement of the hierarchy by which a man would have an assured progress, a greater number of students, and a more certain career for the man who distinguishes himself. Now, the State steps in at the last moment—when Davy, Dalton, or Faraday, has been elected into the French Institute and received the academic honours of the world—then, in his declining years, we begin to think of him, we give him a nominal official employment, so that he may become a Companion of the Bath, and be written C.B. among the junior members of the public service, or we offer him a knighthood or a baronetcy, which we have not given him the fortune to sustain. There is a vast economy in all this which costs us no money, and but little economy of what costs most. We do not save a million from our war material, but spend one million more; while the knighthood or the red ribbon that would gladden the man of forty or fifty is withheld till he has reached sixty or seventy, even if it be not forgotten until his obituary reminds us that he ought to have received it. The man who has enriched his country with wealth or fame thus waits, while a colonel or a major-general, whose name will be forgotten ere his death, has all the distinctions which the public bounty can bestow.

If there were a Minister of Science, with his directors and secretaries, a Minister of Education, a Minister of Agriculture, a Minister of Fine Arts, a Minister of Works, a Minister of Commerce, then the claims of real public servants, and of real public service, would be as well regarded as those which are protected by the First Lord of the Admiralty, or the Minister of War. At the present moment such honours as are conferred are often given in an unworthy manner; a scientific man, an artist, or a manufacturer is offered a distinction by the Prime Minister or Home Secretary, as a reward of his party, and not in due course as the national reward for national services. If a man can get into the army or the navy, or follow the law, he is certain of advancement and promotion, even for services of dubious real value; but let him at his own cost and labour do good for the country, and all assurance of consideration is at an end. He belongs to the pariah castes.

The recognition of learning, science, art, agriculture, manufactures, and commerce, in their public relations, would not be merely a recognition of the claims of individual men, but a recognition of the claims of the real departments of our national prosperity, under the auspices of those who, being their official advocates, would obtain for them their due share of the national regard.

HYDE CLARKE.

ELECTION DINNERS.

Of all the manners and customs of our social system none have undergone greater change than those of election times, and particularly that important part of the elector's duties which treats of the refreshment of the inner man. We are, unfortunately, not of those who believe much in purity of election, and certainly not when the great Beer question is involved. Why English people cannot record a vote as to who shall represent them in Parliament without the necessity for drinking, is one of those mysterious metaphysical questions which no one can pretend to solve. They can transact other business in a sober and rational manner; but the very sight of the hustings, or an election rosette, seems to induce an indomitable thirst. We are, however, willing to admit that the last Reform Bill has considerably quenched the customary "drouthiness;" and, if we progress in the same good path, we may become as easily satisfied as our forefathers were.

Let us take a hint out of Mr. Harrington's diary (1646), and see how the candidates behaved then. "Dec. 26.—Went to the George Inn, at Bathe, at night, met the bailiffes, and desired to be dismissed from the serveing. Drank strong beere and methegline, and expended about three shillinges; went home late, but could not get excused, as they entertained a goode opinion of my father. Dec. 28.—Am to go againe on Thursday, and meete the citizens about alle such matters, and take advice thereon. Came home late at night from Bathe, much troubled hereat, concerninge my proceeding truly for men's good report and mine own safety." We fear that men's good report does not trouble the minds of our present candidates so much now-a-days. In addition to the "three shillinges" spent at the George, Mr. Harrington informs us that on Dec. 31 he dined again there "with the maior and bailiffes, and spent at dinner 6*s.* in wine; laid out in victuals, 11*s.* 4*d.*; in drink, 7*s.* 2*d.*; and, in tobacco and drinking vessels, 4*s.* 4*d.* My father gave me 4*l.* to bear my expences at Bath." Blessed times, when a city like Bath could for 4*l.* be canvassed and secured! But this is nothing to the expenses of an election dinner at Bristol in the previous century, given by Sir Oliver Willie on such a sumptuous scale, that a maiden aunt left 1,000*l.* away from the family, as a punishment for such

fearful extravagance. It came to exactly 15*s.*; and, as our readers will like to see how the bill was made up, we append the *menu*:—

First Course.

	s.	d.
Calves' foot soup	1	0
Roast rabbit	2	0
At Sir Olivers right hand, Stewed cockles	1	0
At his left, Poached eggs with hop tops	1	1
Boiled mushrooms	0	0
Black caps	0	2

Second Course.

Fried sprats	1	2
Tripe in its own liquor	1	1
Rice fritters	0	3
Eggs à la mode	1	2
Oysters on shells	1	0
Radishes	0	2
Black caps	0	2
Butter for cooking, ½ lb.	1	2
Salt and pepper	0	2
Two bottles of ginger wine drank at and after dinner	2	2
Toast and water	0	1
Ordered to four waiters in white waistcoats	1	2
Bread and small beer, whatever you please	0	0
Altogether	15	0

"Ram Inn, Bristol.—Received of Sir Oliver Willie, fifteen shillinges (he deducting a farthing for prompt payment), being a full consideration for Sir Oliver Willie's election dinner, and received in full by me.—R. N."

But, as we come later down, we find that either the electors were not satisfied with such primitive fare. or they ate more. Here is a bill for an election dinner in 1660:—

	£	s.	d.
For bread, ale and tobacco	1	17	6
Sturgeon and butter	1	2	0
Anchovies and oysters	0	14	1
Eight dozen bottles of canary	10	12	0
Two dozen of claret	1	2	0
Neats' tongues	0	6	2
	15	13	9

There was not much to be grumbled at here; but what shall we say of the voters of a *very small* borough, in 1761, exactly a hundred years later, who ate on the day of election, independently of slight refections of veal, mutton, poultry, and pastry, a preparatory breakfast which cost the candidate 750*l.* Afterwards they dined, and the poor starved fellows demolished 780 stone of beef, 315 dozen of wine, 72 pipes of ale, and 365 gallons of spirits for punch! Where could it all have gone, and what would the candidates at the next general election do, if there should be a relative increase in the voters' appetites?

CATTLE DISEASE IN RELATION TO OUR MEAT AND MILK.

As far back as 1862, Mr. John Simon, whose annual medical reports constitute the most precious contributions to sanitary science ever published, informed the lords of Her Majesty's Privy Council that several allegations had been made that the flesh of animals slaughtered while in a state of disease, and likewise the milk of diseased animals, were extensively sold for human consumption in the United Kingdom. He also stated that Mr. Gamgee's report on this subject indicated that a very large proportion of the disease prevailing among live stock in the United Kingdom, which led to the immense pecuniary loss of six millions sterling per annum, *might by proper measures be prevented*; in other words, "that epidemic diseases are due entirely to contagion, originally foreign," and that "the most destructive epidemic diseases are owing, partly to local malaria, which an improved land drainage would dispel, and partly to dietetic mismanagement of stock."

We need not refer to antecedent epochs in the history of the cattle disease question. Mr. Simon's report summarised the evidence, which for some years had been the cause of many warm discussions, especially in Edinburgh; and, after repeated attempts at legislation, the Government was defeated by the agricultural community, whose interests were very grossly misrepresented by those who opposed Mr. Gamgee's views and remedies. Eight years have passed since Mr. Simon penned the words quoted; and, if the doctrine propounded were now submitted to the voice of the assembled masses, whose herds have been contaminated by foreign plagues, an unanimous cry would be raised in its support. The knowledge of an evil is stated to be half its remedy; but, unfortunately, rational counsels have never prevailed, until much too late, on the cattle disease question. The proof of this is to be found in the "Report on Cattle Plague in Great Britain," just issued by the Veterinary Department of the Privy Council. Dr. Alexander Williams says: "In the first place, those most interested in the matter took a long time to be convinced of the highly contagious nature of the disease, and the necessity for taking certain precautions to prevent its spread, especially if such precautions interfered with

their trade. Secondly, there did not exist any Government department whose duty it was to take cognisance of diseases of this nature; and, thirdly, there existed no local authorities, to whom could be properly entrusted the carrying out of any measures which the Government might wish to enforce."

Dr. Alexander Williams inspires us with hope. He goes on to say: "All these difficulties have, however, been met; and it may be confidently expected that cattle plague, or any disease of a like nature, if it visited this country, would be stamped out before it could do any serious damage." What does Dr. Williams mean by "any disease of a like nature?" Is it a stretch of the imagination to suppose that he means a "highly contagious" malady of foreign origin? Of course there are not two rinderpests, but there happen to be the contagious lung disease, and the foot and mouth disease, which have destroyed much more stock than the cattle plague in these islands; and what are we told of these diseases by the veterinary advisers of the Privy Council in the "Veterinarian?" Why, as follows:—"Both in Great Britain and in Ireland these diseases are still very prevalent; indeed, on the increase in many localities. Pleuro-pneumonia has as many as 140 centres of infection in Great Britain, being an increase of 16 during the month. The malady has assumed a very malignant character among dairy cows, and some cowkeepers are known to have cleared out their stock surreptitiously, with a view to save themselves from further loss. The tardy action of some of the local authorities in enforcing the requirements of the Contagious Diseases (Animals) Act is much to be regretted; and, until more energy is displayed, we shall look in vain for any marked diminution, either in this or in the foot and mouth disease. The latter malady prevails in no less than 55 counties, and has 964 centres of infection."*

But this is not all. In the June number of the same journal we are informed that, "out of 208 animals suffering from pleuro-pneumonia during the week ending May 14, 39 are reported to have been killed, and 21 to have died. In the dairies of our large towns, and especially in the metropolis, numerous cases occur which are never seen by the inspectors, the animals being got rid of at a time and in a manner best suited to the owner. It cannot be said that lung-diseased cows find their way, even when in a dying condition, to the knackers, except in very rare instances. They have a value far too great for this in the estimation of the low-class butcher and the sausage maker." Can anything be more disgusting? Yet

* "The Veterinarian" for July, 1870.

what is the Veterinary Department of the Privy Council doing? From the promptitude with which the cattle plague subject has been treated, we shall expect enlightenment on the means of extirpating pleuro-pneumonia about the year 1875. How is it that all the knowledge acquired fails to result in good at the very time when we require its prompt and practical application?

Dr. Alexander Williams says that the returns appended to his "Cattle Plague Report" indicate but a small item of the account of loss. "The value of the property directly lost, without reckoning the indirect losses, which must have occurred in every direction, may certainly be estimated by millions, probably not less than five millions sterling." And what does this term "property" mean? It means "Food." Does Mr. Goschen know this? Is he aware of the fact that such losses in the essential article of food are being sustained *now*? Does he know that a few thousands wisely expended in exterminating contagious cattle disease, by processes which the present Veterinary Department has not the wisdom to suggest and enforce, would give a daily meat dinner to every pauper in the realm?

What are we, as practical people or men reputing themselves endowed with common sense, doing in looking for hidden and intricate ways for increasing our supplies of food, when the sources at hand are contaminated and destroyed? It is like poisoning the water supplies of London, and suggesting that a tubular conduit be laid from the mountains of Norway across the German Ocean to some capacious reservoir in the metropolis. To those who understand the question there is no real difference between the two cases. Nothing is easier than the prompt extermination of the lung disease, and the complete prevention of the foot and mouth disease. The accomplishment of this task would give us, in the current and succeeding years, more animal food than the colonies can supply us for many years to come. But who would dream of adopting such a rational process? It might threaten the existence of the Veterinary Department of the Privy Council. That is quite enough.

We candidly confess that we have no patience with such heedlessness and recklessness. Were it not that Dr. Williams has never professed to know much, if anything, about cattle diseases, we should hold him responsible for one of the grossest instances of official inactivity ever recorded. Somebody must be responsible, and looking at the revelations about the sale of diseased animals as human food, we must ask if Mr. John Simon's influence cannot lead to the adoption of measures alluded to by him as far back as 1862. Surely he would not permit the prevalent idea that the flesh

of lung-diseased cattle is not poisonous to be a bar to prompt and decisive action at the present moment. And where is Mr. Helps? No one will accuse him of lack of intelligence, however much we may doubt his willingness to disturb the organisation of a department which, it may be said, he created.

The report so recently published by this department undoubtedly contains a large amount of information which any statistical bureau must have accumulated, if officially employed and paid for so doing. It is mainly a compilation, and no new fact has been added by the Veterinary Surgeons to the Privy Council in their Medical Report. Professor Simonds does not tell us why, if he did recognise the cattle plague in June, 1865, the public never heard the name of the disease till the end of July. It is notorious that the earlier outbreaks were not properly diagnosed, and hence no proper action was taken, during the most precious moments for its eradication. If the disease was recognised at once, the hesitation and delay in arousing the country to a true sense of its danger cannot be sufficiently censured; and, according to Professor Simonds' statement, the Clerk of the Council should be held responsible for this, since he was told by letter that the rinderpest was in London as early as the 14th of July. Why is that letter not printed?

But we come to the climax. The Veterinary Inspectors of the Privy Council have always had unbounded faith in inspection. Thanks to their faith, we are now sufferers by the foot-and-mouth disease. It has been repeatedly shown that inspection, except when directed on infected centres, and backed by energetic means of repression, is a broken reed on which to rest any confidence as a cattle disease preventive measure. The simple inspection of cattle at the ports of landing has especially been denounced. Referring to the foot-and-mouth disease and pleuro-pneumonia, the Government advisers say, "Until more energy is displayed, and efficient inspectors appointed throughout the country, we cannot hope for much improvement in the present state of things." Inspection at the ports is now relied upon to keep out cattle plagues, notwithstanding the conclusions arrived at by Professors Simonds and Brown; that the examination of cattle affected with rinderpest, both alive and dead, is insufficient to enable them to diagnose the disease without a comprehensive enquiry into the previous history of each case.

This is why Professor Simonds hesitated in naming the disease originally, and why some strange and conflicting opinions were given on various occasions when the cattle plague prevailed! Then why not upset the Inspectorship system, and tell the

country boldly that, as a means of arresting the introduction of contagious cattle diseases into Great Britain, the measures at present enforced are useless? Is it fair to let the country suppose that the precautions adopted by the Veterinary Department are worth paying for, when they are not? By all means inspect; but to inspect without adopting rational means to arrest the evil, or taking every precaution to render such inspection of actual value to the country, is simply throwing money away. We should like to know from Mr. Simon, Dr. Alexander Williams, Professors Simonds and Brown, or anyone else whom the Government can find to answer the question, whether the proposal made by Mr. Gamgee in November, 1863, of having special markets for foreign cattle, and slaughtering all foreign stock at the ports, would not effectually have prevented the many millions sterling loss which, they tell us, we have sustained since 1865, and from which we continue to suffer. How delightful it would be to witness at least one act of foresight and determination, calculated to give the country the benefit of a little practical wisdom! It seems a danger too great to be faced by many of our public men, viz., to insist on the *right thing* being done at once. They are for ever waiting for some extraordinary event and pressure from without. We confess to have a partiality for clear-headed, resolute, and prompt direction, especially when dealing with contagious cattle plagues.

THE *Medical Press* seasonably calls attention to the dangers of carelessly or too freely eating cucumbers, a favourite dish of the working classes, who consume them largely and without peeling. But, cool and refreshing as they are, they contain, and particularly in the skin, acrid and purging properties, which are apt to run into a troublesome form of choleraic diarrhœa. Cucumbers should always be eaten sparingly, and not late at night; and at all times they should be sliced and eaten with salt and vinegar, having been saturated with the latter condiment for some time previously.

FROM the new edition of Baines' "Lancashire" we gain some curious information as to the current prices of provisions at Bolton in 1745, and during the next half century. Between August and Christmas, the average price of beef, veal, and mutton was from 2*d.* to 2½*d.* per lb., pork 3*d.* per lb., and a good stubble goose for 1*s.* 6*d.* In 1787, the Bolton market prices were: beef, veal and mutton 4½*d.*, pork 4*d.* to 5*d.*, a goose 3*s.*, butter 9*d.* to 11*d.* Wheat had in the meantime advanced from 28*s.* to 49*s.* per quarter, while manufacturing wages had probably doubled in the same period. The bread generally eaten at Rochdale, and in the adjoining manufacturing districts of the West Riding, was oatcake. The people were rather proud of this peculiarity, and a regiment of soldiers raised here at the commencement of the last war took the name of the "Haver-cake Lads," assuming as their badge an oatcake, which was carried at the end of the recruiting sergeant's sword.

ON STIMULANTS.

Part II.—OPIUM.

About two years ago the *Indian Medical Gazette* published an article on English opium eaters, which has not been seriously contradicted in this country. We are hence led to infer that there is some, if not entire, truth in the statements made by our Indian contemporaries. It is believed that the practice of opium eating prevails largely in manufacturing towns, especially in Glasgow, Manchester, Stockport, and Birmingham. Dr. Buck, in a lecture delivered about the same time, before the Leicester Philosophical Society, stated that opium eating was very prevalent in that town. He found that the quantity of opium and laudanum sold in Leicester was out of all proportion to merely medical requirements. Two druggists, on whose information he could rely, told Dr. Buck that they sold 130 lbs. of opium and its preparations in twelve months. The quantity used at the Infirmary is 2¼ lbs. per year.

Sir J. Hill describes the effect of opium as causing cheerfulness in the first instance; it removes melancholy and dissipates the dread of danger—the Turks always take it when they are going to battle; it afterwards quiets the spirits, eases pain, and disposes to sleep. But after this effect is over, the pain generally returns in a more violent manner—the spirits become lower than before, and the pulse languid. An immoderate dose of opium brings on drunkenness, cheerfulness, and loud laughter, at first, and, after many terrible symptoms, death itself. Those who have accustomed themselves to an immoderate use of opium are apt to be faint, idle, and thoughtless; they lose their appetite, and grow old before their time.

Opium is a juice obtained from the gummy resinous secretion of certain species of poppy. Those adorning our native fields contain little opium. The white and richer poppy *(Papaver Somniferum)* is a native of warmer regions, and is brought from Natolia, Egypt, and the East Indies. When the heads grow to maturity, but are still soft, green, and full of juice, incisions are made in them, and from every one of these a few drops flow of a milky juice, which soon hardens into a solid consistence. The finest opium proceeds from the first incisions. The mere crude juice which comes into the market is worked up with water or honey, sufficient to bring it into form. A moderate dose of opium taken internally

is generally under a grain, yet custom will enable people to bear a drachm; but in that case nature is vitiated.

The writer in the *Indian Medical Gazette* has come to the conclusion that the moderate use of the drug does not induce such marked premature decay as some would have us believe. In fact, he states that during the cotton famine in Lancashire he saw many cases in which, what he calls, the cruel deprivation of the accustomed stimulus involved more suffering and misery than the scarcity of food.

Pereira gives the constituents of opium as follows:—Morphia, narcotina, codeia, narceia, meconine, thebaina, or paramorphia, pseudomorphia (?), meconic acid, brown acid extractive, sulphuric acid, resin, fat oil, gummy matter, caoutchouc, albumen, odorous principle (volatile oil?), and lignin. Messrs. T. and H. Smith, in 1867, discovered a new alkaloid in opium, to which they have given the name of cryptopia. It is extracted from the weak spirituous washings of crude morphia, the quantity yielded being small; they obtained 5 oz. of the alkaloid from 5 tons of opium.

In a report on the proceedings of the annual congress of German naturalists and physicians (at Frankfort, in 1867), we find that Dr Baxt, of St. Petersburg, spoke on the action of some of the constituents of opium. His experiments had shown that thebaïne was a poison analogous to strychnine, while papaverine had purely hypnotic effects, which were much more strikingly manifested than those of morphine. Professor Köhler, of Tübingen, remarked that in the lower animals all the alkaloids of opium caused tetanic phenomena, and that he doubted the presumed analogy between thebaïne and strychnine. Experiments with papaverine gave inconclusive results, because it was extremely difficult to procure the pure alkaloid. Dr. Baxt insisted that the constancy of the results obtained did not allow any doubts to exist in his mind concerning the accuracy of his experiments. The effects of thebaïne were, indeed, not merely analogous to those of strychnine, but absolutely identical with the same. Professor Traube, of Berlin, mentioned that he had, in his experiments on animals, observed for some considerable time decidedly hypnotic effects produced by the acetate of morphia; while, at a later period, the same preparation, procured from the same chemist, had seemed to cause a great increase of reflex excitability. He concluded that if one wanted to make exact experiments with these alkaloids, it was necessary to prepare them specially, as those obtained in commerce could not be warranted to be perfectly pure.

The importance of opium in the earlier stages of insanity, and its great medicinal virtues in the treatment of disease, urgently demand

a thorough investigation of the subject. The drug operates as a powerful and very diffusible stimulus; it acts directly on the nervous system; and, when taken into the stomach, destroys irritability, and allays pain in the most distant parts of the body, independently of the circulation, and without inducing any change in the composition of the blood. A writer to that valuable little periodical, "The Practitioner," relates a few cases showing the effect of small doses of morphia in increasing the appetite of animals. One of these we will quote here in abstract. "A healthy young cat," says Mr. Oglesby, "deprived of food for several hours, had a temperature of 101°. At a specified time in the morning, a solution of bimeconate of morphia, containing one-eighth of a grain, was injected beneath the skin. Half-an-hour afterwards, the temperature fell to 99°; it remained almost steady for two hours, after which it began to rise, increasing to 102° after six hours from the commencement of the operation. The effect of the dose was very marked, the cat being much affected by it, jumping and running round the room, and uttering plaintive cries. The increase of temperature lasted many hours." The susceptibility to the action of opium is by no means the same in different animals. Dr. Weir Mitchell, the American physiologist, administered twenty grains to a pigeon in one day, without the slightest effect resulting. At the meeting of the Medical Society of London, in April, 1869, Dr. Richardson exhibited a pigeon on which a similar experiment had been tried, but had been carried to a much greater length, and the results of which were the same.

The tolerance of opium in some individuals is enormous in comparison with ordinary mortals. Dr. Holcomb reported a case to the Berkshire Medical Society, in which the patient, some days prior to her decease, had increased her allowance to sixty grains per day, never exhibiting any symptom of narcotism. Dr. Allen, in a severe case of colic, has given half a drachm of morphia in six hours, the patient recovering. Dr. Adams knew a patient who took the equivalent of eighteen grains of opium at a dose.*

In countries where opium is indigenous, the natives can take with impunity what might prove fatal to the foreigner. Dr. Francis E. Anstie, to whose instructions on the subject we are largely indebted, says distinctly that the use of opium by Orientals, is an important and genuine one; it acts as a powerful food stimulant, enabling the consumer to undergo severe and continuous physical exertion without the assistance of ordinary food.

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* "Boston Medical Journal," July 31, 1867.

Dr. Barnes* relates a striking instance of its power to recruit an exhausted frame:—"On one occasion I made a very fatiguing night-march with a Cutchie horseman. In the morning, after having travelled thirty miles, I was obliged to assent to his proposal of halting for a few minutes, which he employed in sharing a quantity of about two drachms of opium between himself and his jaded horse. The effect of the dose was soon evident in both, for the horse finished a journey of forty miles with great apparent facility, and the rider absolutely became more active and intelligent." Recent observations encourage the hope that an antidote has been found, which, by its antagonistic action to opium, may prove a powerful agent in cases of opium poisoning. The substance alluded to is belladonna, which has been used with good effect by Dr. Radcliff, at Westminster Hospital. In one case the patient was admitted a quarter of an hour after swallowing three drachms of laudanum; she was scarcely sensible, skin cold, pupils much contracted and fixed, very sleepy, and complained of mist before her eyes. A sulphate of zinc emetic was administered, and after that she was given strong coffee. Four hours afterwards a castor oil and turpentine enema was given, a mustard poultice applied to the pit of the stomach, and ten minims of tincture of belladonna given every half hour. The belladonna was continued till the evening of the following day, with the best effects. On the fourth day from admission the patient was convalescent. *En passant*, it may here be mentioned that laudanum is the tincture of opium of the shops, which is made by pouring two pints of proof spirit of wine on two ounces and a half of powdered opium. These articles are allowed to digest for a week or two, and then strained, when they are fit for use. The usual dose is from twenty drops to a drachm. "Black Drops," or "Sedative Liquor of Opium," or "Battley's Solution," are more eligible remedies for general purposes, being more powerfully anodyne, without affecting the head or confining so much as laudanum. They owe their strength and mildness of operation to the manner in which they are prepared with vinegar, or some other vegetable acid. Various other preparations for the cure of one, several, or all complaints appear under the names of Cough Drops, Pectoral Balsam of Liquorice, Essence of Coltsfoot, Elixir, and many more. They are preparations of opium, very similar to paregoric elixir, and not unfrequently remarkable for the mischief which they do, especially in coughs arising from suppressed perspiration, or an inflammatory state of the system.

E. H. Fournier.

[TO BE CONTINUED.]

* "A Visit to Scinde," etc., p. 230.

FOOD SUPPLIES FROM THE ANIMAL KINGDOM.

AMONG our supplies of food from the animal kingdom, beef, mutton, and pork occupy the principal place, and probably will always continue to do so. Of the mammalian portion of the animal kingdom, one order stands pre-eminent in the fitness of its flesh for human food,—the order of ruminants,—including sheep, goats, deer, antelopes, etc.; and the ox and sheep, through domestication and the care of man, have been made to yield supplies vastly more abundant than are obtained from all the wild quadrupeds in the world; nor do any other species appear to be naturally so well suited for this purpose. When we entertain the question of adding to our meat-supplies by importation from foreign countries, it is to the flesh of the ox and the sheep that we must look as alone likely to be obtained in sufficient quantity. It is unnecessary to do more than allude to the large importation of live cattle from the Continent of Europe. This, however, is certainly not a source from which enough can be obtained, even if there were no question of loss in our own country, through diseases introduced by the live cattle from abroad, more than equivalent to all the amount of importation. We must turn our thoughts to more distant parts of the world, where oxen and sheep exist in vast numbers, and where there are few consumers; and probably rather to the importation of meat preserved in some way than to that of live cattle.

But whilst we are solving this question, it may be well for us to consider if we are not wasting much at home. We do not refer to the waste which takes place after animals are killed, but to that which arises from the unhealthy condition of cow-houses in towns, and from the present mode of the transport of cattle. The number of milch cows which die annually from pleuro-pneumonia and other diseases in towns, and even in country pastures, is very great; and there is good reason to think that it is mainly to be ascribed to the condition of the cow-houses in towns, and to the imported cattle which bring the disease with them from foreign countries. The transport of cattle by railway has many advantages over the old system of driving them along the road. But they are generally deprived of food and water during the long time that they are in the trucks, and they necessarily arrive at the place of their destination in an unhealthy state; in fact, many die from the treatment to

which they are thus subjected. Here is a waste which might easily be prevented,—a waste which of course increases the price of butcher's meat, whilst it tends to deteriorate the quality of that which is brought to the market. In the importation of cattle from the Continent, there is a similar neglect of those means by which the health of the animals might be maintained. Considerations of humanity, as well as of economy, demand the prompt adoption of measures—legislative, if necessary—to secure the better treatment of cattle, both in steamers bringing them from the Continent, and during railway transport in this country. It is often alleged, we know, by those engaged in the cattle trade, that cattle will not eat in a steamer or in a railway truck. We are assured, on the best authority, that this statement is utterly false. Being hungry, they will eat, if food is within their reach; being thirsty, they will drink, if they can get water. A railway truck fitted to supply cattle both with food and water has been invented, but on no railway in Britain is it yet in ordinary use. We are sometimes told that we cannot expect South American beef to be good, because of the manner in which the cattle are driven to the ports where they are slaughtered; but it may be doubted if they are subjected to treatment more cruel than the beasts which we import from Holland, or those which are conveyed along our own railways.

The zebu, of India, may probably be regarded, notwithstanding its remarkable fleshy hump, as a mere variety of the common ox, which it almost exactly resembles in its properties and uses. The buffaloes of the warm parts of Asia and of Africa differ more widely from the ox, notwithstanding a great general resemblance; but they are also in properties and uses very similar. Several kinds have been domesticated in different parts of the world. They seem to be adapted only to tropical and subtropical countries, and particularly to marshy or swampy regions. Sir James Emerson Tennant, in his work on Ceylon, has pointed out that the peculiar conformation of their feet, with widely spreading hoofs, adapts them in an especial manner to those regions, as a similar conformation of the foot of the reindeer adapts it to the surface of the snows of the north. The flesh of the buffalo is coarser than that of the ox, but the milk is excellent and very abundant; and the value of these animals as beasts of draught is highly appreciated in the countries in which they are found. The common buffalo is now plentiful in some parts of Italy, into which it was introduced some centuries since. Of the South African and other kinds, it seems unnecessary here to take particular notice. The name buffalo is popularly given

in North America to a species of the ox tribe, roaming in vast herds on the prairies of the regions westward of the Mississippi; it is not, however, in reality a buffalo, but a bison, very similar to, if not absolutely indentical with, the bison or auroch of Europe, now very rare, and only existing in some of the forests of Lithuania. That the flesh of this animal is very much esteemed in the regions which it inhabits, every one knows. Of it the *pemmican* is made, which forms so large a part of the food of the Canadian voyageurs, and of the hunters of the most northern parts of America. The animal, however, exists only in a wild state. No attempt appears ever to have been made to domesticate it, although it seems well worthy of the attempt, and is probably not incapable of domestication.

The only other species of the ox tribe which demands special notice at present, is the yak, of the Himalaya mountains; a species remarkable in appearance, and evidently very distinct from any other species known. It has been thoroughly domesticated by the Thibetans, and is of great use as a beast of burden; its habits specially adapting it for its native mountainous regions, and the steep rugged slopes, often covered with snow. Its milk is also much used as an article of food, and its long soft hair seems almost capable of being employed like the wool of the sheep. The introduction of the yak into Norway and Iceland would probably be of great advantage to those countries.

It is impossible to pass from the subject of oxen without adverting to the great quantity of dairy produce which they yield us, and to the advantage which we derive from the large importation of butter from Holland, Friesland, and Holstein, and of cheese from Holland and from America.

None of the antelope tribe are domesticated in any part of the world for any useful purpose; although some of them, as the eland and koodoo, seem very capable of it, and their domestication has been proposed. The same general remark applies to the deer tribe, with the exception of the reindeer, which is extensively domesticated in the north of Europe and of Asia, whilst it is also employed as a beast of draught, and much valued for its milk and flesh. The flesh of the reindeer may probably yet become a considerable article of importation from the northern parts of the world. We happen to know that an enterprising firm in Edinburgh, Messrs. Maclean and Son, recently bought about 10,000 reindeer tongues, besides a large quantity of reindeer hams, which have been sold in the markets of England as well as of Scotland: and it seems not improbable that this article of food—or of luxury,

if it may be deemed so—might be obtained, if proper means were used, much more abundantly and more cheaply than hitherto, to the advantage of Lapland and Siberia, as well as to our own.

The number of swine fed in this country has greatly increased within the last half century, and the increase still appears to continue; district after district entering into the competition for the production of pork, bacon, and hams. That the result has been a great increase of our food supplies there can be no doubt, the swine being in great part fed by the utilisation of what would otherwise have been thrown away as refuse.

The hog is one of the order of *Pachydermatous* quadrupeds. Of this order almost all are used for food in the countries of which they are natives. The flesh of the elephant is said to be good, and that of the tapir to be of peculiar excellence. These, however, demand no consideration in connection with our present subject. The *Equidæ*, or horse and ass tribe, are commonly ranked among the *Pachydermata*, although they are so different from the rest that some naturalists have constituted them into a distinct order. We do not think it necessary to say much of *hippophagy*, although it has recently been so much urged upon public attention. That horse-flesh is wholesome we do not doubt. Its flavour may be disagreeable to some, as Mr. Buckland tells us he found it to be to himself; but there is no disputing about tastes, and those who like it may well be allowed to eat it. As to its advantageous use, however, a difficulty presents itself in the high price of the horse,—so that, except when a horse in good condition breaks its leg, or is otherwise rendered useless by some accident, we see not how any horse-flesh is to be brought to the market except that of old, worn out animals. We should not like our beef to be that of oxen in a similar condition.

There is one other order of mammals which adds a little to our supply of animal food—the *Glires* or Rodents. Some of this order, as rats and mice, are so far from being deemed eatable, that the very idea is repelled with disgust; but others, as the hare and rabbit, are esteemed for the table. As to the hare, it is probable that the cost is greater than the profit, for it consumes the pasture which might better be devoted to oxen and sheep. In many places, rabbits are for the same reason a nuisance, although in some woods and sandy tracts their existence may be advantageous, where they feed on herbage that cannot be turned to better use.

J. Montgomery.

[To be continued.]

THE VALUE OF GELATIN AS FOOD.

THE general appreciation of articles of food more or less exclusively gelatinous, such as isinglass, jellies, cod sounds, calves' feet, cow-heel, calf's head, etc., was a few years since denounced by some persons as an error; and, in opposition to the general experience and common sense of mankind, they maintained that gelatin and gelatinous articles of food were of no value whatever, and that the benefit of, say, half a pint of strong calf's-foot jelly solely depended on the tablespoonful of wine which it did or did not contain.

The grounds on which this extraordinary opinion was based were chiefly twofold: firstly, that gelatin is not found in the blood; and, secondly, that an animal fed on nothing else than gelatin speedily dies of starvation. The absence of gelatin from the blood does not prove that it is not nutritious. Milk is the model food, the only substance expressly created for the nourishment of animals, and which has no other use in the economy of nature. Now the albuminoid, or flesh-forming substance, in milk is the curdy matter, or casein; no one can deny its value, except perhaps the persons who say that gelatin is not nutritious; for casein, like gelatin, is never found in the blood. If we turn to the latest, and certainly the most exhaustive, treatise on physiology which has been recently published, namely, that of Marshall, we shall find that the value of gelatin is thus stated:—"Gelatin is not found in the blood itself, but when digested is converted into a gelatin-peptone, and so becomes absorbed as we have seen, but in what state is not yet known. Nor is its destination in the nutritive processes of the body certain. Either it may serve for the direct nutrition of the gelatin-yielding tissues, or—and this is very probable—it may by itself, undergoing oxidation, conserve other more important tissues, and at the same time maintain the temperature of the body. Its efficacy, as administered in jellies, etc., in cases of sickness, especially indicates its importance as an article of diet."

Dr. Edward Smith, F.R.S., in the fourth edition of his valuable "Practical Dietary," states that gelatin "exists very largely in the skin, horns, hoofs, tendons, and bones of animals, and in a less amount in the flesh. Hence we obtain it from calve's feet and

cow-heel when boiled for that purpose, from the shin and other parts of beef when prepared for soup, and from bones which have been broken and boiled for many hours in water. Whether, therefore, as jelly or in soup, this substance is largely eaten; and yet it is affirmed even to this day that it is innutritious, and therefore worthless as food. My own experiments have proved that gelatin, like albumen, is transformed within the system, and leaves the body as urea, and hence it must have played its part in nutrition; but whether its nutritive value is quite equal to that of albumen, is another question. I believe gelatin to be a valuable food, and every one knows that, with the addition of wine and other substances, it is a very agreeable one. It is, however, very probable that it is not an economical food as it is ordinarily prepared, but it may be cheaply obtained in soup from bones."

I now come to the second so-called argument by which the uselessness of gelatin is attempted to be maintained. It is said that an animal fed on gelatin dies rapidly of starvation and inanition. This is perfectly true; but the fact is, that no simple substance given alone will support life. The most nutritive materials, such as albumen, fibrin, gluten—to say nothing of such substances as starch or sugar—all equally fail to support life when given alone. Good wheaten bread will support life any length of time; but separate the starch, gluten, and other constituents, and give them singly, and, if the argument above adduced holds good, you could prove each of these substances to be totally without value as food, as neither will support life when used alone.

I believe that this false opinion respecting the valueless character of gelatin arose from some experiments on the feeding of convicts in some of the French prisons. They were supplied with a very small quantity of gelatin in place of other articles of food, and soon showed symptoms of starvation. The fact that dogs, though they die rapidly when fed on perfectly pure gelatin, will live any length of time if kept on soft bones, which consist almost exclusively of gelatin and bone earth, is a convincing proof that the gelatin is a valuable article of diet.

Although I believe that no amount of preaching on the part of dabblers in physiology would controvert the practical experience of mankind, and abolish the use of mock turtle, jellies, and other gelatinous articles of diet, I am anxious to show that these absurd views are not held by the highest authorities, and that the value of gelatin, although it may be denied by some, is fully maintained by our best scientific writers.

W. B. Tegetmeier.

DOMESTIC RECIPES.

The Editor desires to appeal to his readers, and especially to the ladies, for contributions of recipes for cheap, tasty, and serviceable dishes, both for poor households and those of the higher classes.

VEGETABLE SOUP.

Place one onion, cut in pieces, in a saucepan, with 3 oz. of butter, and brown it; then add finely-shredded turnips, parsnips, leeks, carrots (also a white carrot, if procurable), green celery, a little sorrel, one small potato, and a few French beans and green peas, all of which are to be tossed and browned in the butter, with sufficient quantities of salt and pepper. Pour in a little water or stock, crush the vegetables slightly, then fill up with more water, and let the soup simmer for two hours. A little rice or pearl barley can, with advantage, be added to the vegetable. Care must be taken not to get the soup of too thick a consistency.

TO KEEP MUSHROOMS WITHOUT PICKLE.

Let the mushrooms be peeled, and the insides taken out; then lay them to soak in water for two or three hours, after which they must be dried. Lay them on tin plates, and set them up in a cool oven, an operation which must be repeated several times, until they are thoroughly dry. They must then be put in pots, and kept from damp.

TO MAKE KETCHUP.

To a peck of mushrooms, put two handfuls of salt. Let them stand two days; then strain them out, and boil for half or quarter of an hour. Scum them well, and season as you like with ginger, pepper, cloves, and garlic, all of which must be boiled but the garlic; let them stand for a day or two, and then put into bottles with sweet oil, tying over some perforated paper.

A COUNTRY CAPTAIN.

Cut a fowl to pieces as for a fricasée; salt, pepper, and cayenne pepper it to taste. The fowl must be fried in butter by itself; three or four large onions fried brown in butter are to be sent up with it, with fried crumbs of bread, lemon peel, and gravy as for a roast fowl.—*From an Old M.S.*

A TURKISH BROIL.

Cut from a small cod-fish as many slices as are required, rub them with a little salt, and dip them in flour; then rub a gridiron with olive oil, lay the fish over, set it on a moderate charcoal fire, and turn the fish often. When nicely browned on both sides, take it off, then cover the surface of a dish with some finely-chopped parsley and onions, place the fish over, with one or two lemons cut in quarters round the dish, and serve hot.

NOTES OF THE MONTH.

As a rule, we are slow to change our ways in little things, as we are in great ones; and the introduction of any new system, or article of consumption, is in England a work of time and difficulty. But in some of our smaller luxuries, there is a very decided improvement within the last few years,—an improvement which we would fain have extended. Take for instance our summer drinks. Lemonade or kali was, a few years ago, the height of our ambition; and, if it could be iced, 'twas luxury indeed. Now we revel in an Elysium of ice-cream soda drinks, which are as pretty to look at as they are charming to imbibe. These, as all the world knows, are an American importation of Dows, Clark and Co., and although we cannot quarrel with the price, we should be still more rejoiced if a cheaper (and perhaps less luscious) form of this beverage could be supplied for the thirsty souls who can only afford 2*d.* a glass. It would be a real god-send if the American soda bar could be patronised a little more, and the public-house a little less. At London Bridge, too, we notice a nice bright coffee restaurant, established by the French Coffee Company, and would wish to see many such scattered over the town. When we recall the old-fashioned coffee shop, with its dirty boxes, its dubious crockery, its flies, and the "bitter goblet" which we had to swallow under the name of coffee, we welcome any place where taste, brightness, and excellence of supply prevail. It is the province of the "Food Journal" to call attention to improvements in minor details as well as in more important matters.

A CORRESPONDENT writes to us with respect to Professor Pettenkofer's remarks on cattle drinking liquid manure. He says, "On my father's property, a liquid manure tank was placed outside the cowshed to collect the soakings for the cucumber frames. I have seen different cows come regularly to drink at this tank, passing *within twenty yards of a pond of good water in the same field.* When I told the bailiff of it he had a cover made, which the cows tried hard to remove. Were they seeking the saline ingredients?"

ONE terrible source of food waste is monthly presented to us in the returns of seizures of diseased meat and fish in the various markets. Fifty four tons of fish were destroyed during the last month in London, numbering altogether 165,002. The items were made up of 36 brills, 36 cod, 3,365 crabs, 720 dabs, 6,733 haddocks, 116,290 herrings, 959 lobsters, 14,269 mackerel, 20 mullets, 14,370 plaice, 203 salmon, 131 shads, 16 skate, 2,000 smelts, 1,150 soles, 1 sturgeon, 743 thornbacks, 109 trout, 251 turbot, 3,600 whiting, 53 bushels of periwinkles, 160 bushels of whelks, 1,938 gallons of shrimps, 640 lbs. of eels, 91 lbs. of salmon. It is worthy of remark that out of the number of fish destroyed, 14,635 alone arrived by water, which points to a defect in the railway or inland carriage. Another fact is that Billingsgate contributed 50 tons to the waste-heap, while Columbia market sent only four tons. What is the reason of this great difference? Again, in Manchester, in 37 days (between June 24th and July 31st) 29 tons had to be destroyed, consisting of 63,952 lbs. herrings, 235 lbs. haddocks, and 235 lbs. soles. There surely must be some means of preventing this dreadful waste, and we shall be glad to have the views of practical men upon the subject.

Some of the results mentioned in the August article, "War and Our Food Supplies," have already come to pass. We are informed that the French army is extremely short of provisions, and that the commissariat is paying as much as 1½ franc per pound for meat, a price which is likely to increase rather than diminish.

There is a talk, which we earnestly trust may ripen into action, of making Leicester Square a flower market. A more desirable change could not take place, desirable not only in an architectural and æsthetic sense, but on moral and sanitary grounds. Perhaps within a year or two, we may see that desolate gamin-haunted area covered with pretty buildings and a bright array of flowers, whose perfumes will replace the unsavoury odours which now pervade the square, and whose presence will assuredly induce a purer and more respectable moral atmosphere. Covent Garden too, which has long suffered from repletion under a badly arranged system, would find no little benefit from such an establishment as is now proposed.

One branch of the provision trade which is unfortunately suffering from the war, is that of the herring fishery. It is not that herrings are not abundant, for they never were more so, both on the east coast and in the Hebrides. But the curers have gone so extensively into the foreign markets with their supplies, that they have to a great extent neglected the home demand. Now that the former are virtually closed the herrings are so perversely plentiful that they have to be thrown back into the sea, and sold for manure at less than 2*s.* a cran. With all this terrible waste, the *Farmer* tells us that the retail price of herrings in Edinburgh is 6*d.* a dozen! We do not pity the perplexity of the curers half so much as we do the hungry mouths to whom a little of this "manure" would be such a blessing.

Bad as are the times, the British farmer has no occasion to grumble overmuch. Mr. Saunderson's report on the condition of the harvest, recently published in the *Times*, sums up by saying that "crops of every description have proved better than their appearance at one time indicated; beef and mutton command high prices. The value of store cattle, usually unsaleable in years of extreme drought, has been maintained; and, at the great lamb fairs recently held in the North, the high prices of last year have been exceeded."

Mr. Bailey Denton is calling urgent and well-timed attention to the terrible lack of water supply in many of our villages, which, as a rule, are utterly deficient in anything like sanitary organisation. Villages in Kent (notably one near Sevenoaks), and on the high ground of the Chiltern Hills, in Bucks, are literally without a drop of water for drinking or household purposes; and it is very difficult for those who have never suffered such a scarcity to realise the discomfort and the evils which it entails.

BOOKS RECEIVED.

"Health and Longevity." By L. J. Beale, M.R.C.S. Second Edition. J. Churchill & Sons.

"Dublin Quarterly Journal of Medical Science" for August. Fannin and Co.

THE

FOOD JOURNAL.

FOREIGN OFFICE REPORTS ON THE ADULTERATION OF FOOD, ETC.—PART II.

IN our last number was commenced a series of elaborate Reports, furnished through the Foreign Office, on the first question of our Circular, viz. :—

"What legislative enactments at present exist, and when passed, in the country to which you are accredited, respecting adulteration of food and drink? Are these laws actively enforced, and how far do they appear to meet the evil?"

We then dealt with the laws which are in force in the cities and towns of Hamburgh, Leipzig, Konigsberg, and Memel; and we now carry on the enquiry to the Hague; Florence; Athens; Salonica and Smyrna; Trieste, Ragusa, and Fiume; Alexandria and Tangiers; Charleston, Mobile, and Buffalo.

THE HAGUE.—Mr. Locock, in a very exhaustive report on the Netherlands, states that adulteration is there accounted a trivial or a serious offence, according to the innocence or hurtfulness of the adulterating matter. In this respect the Dutch law is very similar to that of the French, having originally been little more than a transcript from the Code Napoleon; which, as regards the less heinous form of offence, runs thus:—"Whoever shall have sold or retailed adulterated drinks not containing any mixture injurious to health, shall be liable to a fine of from 6 fr. to 10 fr." (Penal Code, art. 475, sec. 6.) With respect to the more serious cases, the Dutch law *formerly* ran as follows:—"Whoever shall have sold or retailed adulterated drinks containing any mixture injurious to health, shall be punished with imprisonment of from six days to two years, together with a fine of from 16 fr. to 500 fr. The adulterated drink found in the possession of any seller or retailer, shall be seized and confiscated." (Penal Code, art. 318.) This original Dutch law, however, was altered in 1829 by a fresh one having been promulgated, for the purpose of bringing the adulteration of eatables within the

same category as that of drink; as also of providing heavier penalties for the mixture of really poisonous matter with articles of either food or drink. As this law is still in active force, and is of a comprehensive nature in providing ample punishment, not only of principal offenders, but of all aiders and abetters, a translation of the eight articles of which it is composed is appended.

"*Art.* 1.—All persons who shall have mixed, or caused to be mixed, in bread intended for sale, or in other articles of food or any ingredients thereof, blue vitriol, copperas, white vitriol, or any other poisonous matter, shall be punished by an imprisonment of not less than two, and not more than five, years; and by a fine of not less than 200, and not more than 500, florins; together with the withdrawal of their license, and a disqualification during the period of imprisonment to obtain another such license.

"*Art.* 2.—All persons who shall have mixed, or caused to be mixed, poisonous matter in articles of drink, or of the ingredients thereof, shall be punished with similar penalties.

"*Art.* 3.—The penalties described in the foregoing articles shall also be inflicted on all persons who shall have sold, or attempted to sell, with guilty knowledge, any such adulterated bread, articles of food or drink, or ingredients thereof, mixed with poisonous matters; as mentioned in Articles 1 and 2. *The same penalties shall likewise be inflicted on all persons who shall have sold poisonous matters, with a knowledge that they would be employed in an infringement of the law.*

"*Art.* 4.—In order to extend and amend Art. 318 of the Criminal Code already in operation, the penalties mentioned in that Article are by these presents declared to be applicable to all persons who shall have mixed, or caused to be mixed, matters injurious to health, with bread intended for sale, articles of food or drink, or the ingredients thereof; or who shall have sold, or attempted to sell, such articles of food or drink, or the ingredients thereof.

"*Art.* 5.—In case of a repetition of the offences mentioned in the preceding Articles, the penalties named in Article 58 of the Criminal Code shall be inflicted.

"*Art.* 6.—In addition to the penalties named in Articles 1, 2, and 5, the Judge shall order the sentence to be *placarded and published at the expense of the person convicted.*

"*Art.* 7.—The penalties provided by this law shall in all cases be accompanied by the confiscation and destruction of the bread, articles of food or drink, or the ingredients thereof, which shall have been mixed with poisonous or injurious matters.

"*Art.* 8.—The provisions now in operation of Article 302 of the Criminal Code, referring to persons guilty of the crime of poisoning (as this crime is described and defined in Article 301 of the same code), are in no degree or manner affected by the present law."

Mr. Locock finds that this law is sufficient to repress the offences against which it was framed, and that it is but seldom that the heavier penalties have to be inflicted.

FLORENCE.—Sir A. Paget encloses the copy of a note from the Minister for Agriculture to the Minister for Foreign Affairs, in reply to the questions put by the English Government. It is there stated

that a Supreme Council of Health is established in the capital of the kingdom, while supplementary councils exist in every province and every district. They are entrusted with the inspection of the trades of chemists, vendors of liquors, confectioners, manufacturers of chemicals or of mineral and gaseous waters, herbalists, brewers, etc.; and they are bound to denounce to the authorities any adulterations of food or drink which may be injurious to the public health. The syndics of the different communes are expected to look to these matters, either in person or by the municipal commissaries of health. The law considers as unwholesome all unripe fruit, tainted meat, fish, grain, or vegetables, the flesh of animals which have died of disease, beverages adulterated with noxious matters, or which have become impure from fermentation. Persons offending against these regulations are punished by a reprimand, and suspension from their trade for a period of from five days to three months. Moreover, by the Sardinian Penal Code, which is in force through the greater portion of Italy, vendors and carriers of any articles of food, wine, spirits, liquors, etc., which are bad in themselves, or are adulterated, may be imprisoned for from one month to two years. If the death of any person should arise from such conduct, the imprisonment may be extended to seven years; and even heavier penalties may be inflicted, if any malicious intention can be shown.

GREECE.—Mr. R. G. Watson, Secretary of Legation at Athens, reports that the prevention of adulteration of food and drink is provided for in the Royal Ordinances of 1835, regarding markets and food, and by succeeding ordinances of 1836 on the Communal Police. These ordinances have the force of law. In addition, certain articles of the Penal Code (which was drawn up in the first instance in German, in 1833, and afterwards translated into Greek, in the reign of King Otho), punish infringements by a fine of from 5 to 200 drachmæ (3*s.* 9*d.* to 7*l.* 10*s.*), and an imprisonment of fifteen days. The adulterated goods are confiscated and destroyed.

SALONICA.—Consul Wilkinson states that no laws at present exist here regarding adulteration; but at

SMYRNA, according to Consul Cumberbatch, any person convicted of the offence, so as to endanger life, is liable to imprisonment for from one week to two years, according to the amount of injury sustained. A fine is also inflicted of from 1*l.* to 25*l.*, with forfeiture of the adulterated article. There is, however, but little adulteration carried on at Smyrna, except perhaps in the coffee mills, where khorassan and burnt oats are sometimes mixed with the coffee, to prevent which special persons are appointed as inspectors.

Trieste.—Consul Lever reports that, by a distinct article of the Penal Code of Austria, published in 1852, any adulteration of food shown to be deleterious, is punishable by imprisonment up to six months.

At Fiume, we learn from Vice-Consul Hill, and at Ragusa, from Consul Paton, that the same code is in operation; but that a fine is added to the imprisonment. The laws, however, are not very actively enforced on these points, and it is but rarely that a case of exposure happens.

Alexandria.—Col. Stanton writes, that preventive measures against adulteration were established in principle in Egypt by a decree of the Health Officer of Alexandria, in the Mohammedan year 1257, about the commencement of our year 1841. This enactment, which applied to the whole country, has since been included in the Sanitary Regulations of the Egyptian Government, published January 1, 1866; and more recently, in the Municipal Regulations of Alexandria, which have the force of law. The Sanitary Board is charged with the supervision of all articles of food offered for sale, and with the carrying out of special rules for adulteration, to the following effect:—It is forbidden to sell, either wholesale or retail, any damaged or adulterated flour. Bread must be baked of good wheaten flour; and the admixture of anything else but yeast, salt, and water, will be considered an infringement of the law, and render the bread liable to seizure. The same rules that apply to the bakers apply also to confectioners, etc., who are responsible, not only for the purity of the ingredients used, but for the cleanliness of all persons and utensils employed. Confectioners and sweetmeat makers are strictly forbidden to use any unwholesome or poisonous matter for colouring or flavouring their bonbons and liqueurs; and the masters of such establishments are personally responsible for any accident or damage that may happen through inattention on the part of their employés. Brewers and sellers of spirituous drinks are all liable to inspection, so as to guarantee purity of the article supplied. These regulations are amply sufficient to protect the public, save in one respect—that they do not apply to foreigners residing in Egypt, who are not subject to municipal laws. The Inspectors have not the right of entering foreigners' establishments, so that, in these cases, the rules are unfortunately a dead letter.

Tangiers.—In this city, according to Sir J. Drummond-Hay, all matters connected with the sale of articles of food are, by an ancient Morocco custom, placed under the supervision of an Inspector of Markets, called "El Mehteb," who is appointed by the

"Kaid," or Governor, of each town. This officer takes cognisance of all offences against the rules of the market; with which he deals in a most summary way, by fine, imprisonment, or *bastinado*.

America.—Consul Cridland reports that, at Mobile, the code of Alabama is in force, which provides for offences against public health. (Part 4., title 1, chap. 6.) Any butcher or other person who sells, or allows to be sold, tainted or diseased meat, or the flesh of any animal which has died otherwise than by slaughtering, may, on conviction, be fined not less than 20, or more than 200, dollars; he may also be imprisoned in the county gaol, and sentenced to hard labour for not more than six months. The same punishment may be inflicted on any baker, or other person, who sells, or allows to be sold, *bread* made from impure, sour, or unwholesome flour; also upon any merchant, grocer, or other person, who sells any *sugar* mixed with foreign matter, so as to deteriorate the quality and defraud the purchaser. Any manufacturer, brewer, distiller, grocer, tavern-keeper, retailer of wines, spirituous or fermented liquors, who shall sell, or allow to be sold, wines or liquors adulterated by any unwholesome ingredient, may be fined not less than 100, or more than 500, dollars; and is, moreover, liable to imprisonment and hard labour for six months. The result of the enforcement of these laws is, that they are not often violated.

In Buffalo, according to Consul Hemans, the bye-laws regulating the internal affairs of the town, take cognisance of these matters, though there are no clauses having reference to adulteration as a specific misdemeanour. The only regulation which can be classed under such a head, is one enforcing a penalty of 50 cents per loaf for the sale of bread made from unwholesome materials.

We learn from Consul Walker that, at Charleston, all dealings are governed by the reputation for integrity maintained by the dealers. The only legislative enactment is that passed in 1857, for the inspection of flour; although, even in this case, it is not made compulsory. In its character for honesty, Charleston certainly sets an example to all other towns.

[to be continued.]

The *Chemical News* quotes from *Les Mondes*, to the effect that vine leaves and the cuttings of young vine twigs are largely given in France to cattle, in a fresh state, and are also partly salted for winter forage. Since France possesses 2,500,000 hectares of vintage ground, this new utilisation of material will furnish food for a great number of cattle.

THE IN-GATHERING OF THE HARVEST.

The custom of keeping the "harvest home" has descended from very remote antiquity to our own time, and is periodically observed, with a more or less ostentatious display of festivity, and even of religious ceremonial. The Jews rejoiced and feasted on the in-gathering of the harvest; and the heathen, for the most part, who borrowed this custom from them, made an offering of the first-fruits to the gods, while occasionally making merry with their servants who had laboured for them in till ingthe ground. Callimachus's "Hymn to Apollo" is evidence that the heathen ignorantly misapplied the acknowledgment of this festivity, not directing it to the primary fountain of the benefit—Apollo, or the Sun. *Vacina Dea* or *Vacuna*, the tutelar deity of rest and ease, was the name of the goddess, to whom sacrifices were wont to be offered at the end of harvest.

With the Peruvians, the sixth month of the year was a season of remarkable festivity. As many as one hundred sheep of divers colours were sacrificed, and the crowning ceremony consisted in conveying the corn from the field into the house, when songs were sung and prayers offered that the maize might long continue. Purchas, in his "Pilgrimes," published as far back as 1626, quoting from Acosta, states that "They put a quantity of the mayz (the best that groweth in the farms) in a thing they call *pirva*, with certain ceremonies, watching three nights. Then do they put it in the richest garment they have, and being thus wrapped and dressed they worship this *pirva*, holding it in great veneration, and saying it is the mother of the mayz of their inheritance, and that by this means the mayz augments and is preserved." A custom somewhat analogous to this obtained in one of our English counties; and probably from the Peruvian *pirva* was derived the "Ivy Girl of Kent." This consisted of a rude, human-shaped figure composed of the finest corn. It was decorated by the women with trimmings, such as a cap, ruffles, etc., cut out of paper, but so ingeniously and deftly wrought as to have the appearance of lace. As it invariably accompanied the last load of corn, it was presumed to entitle the labourers to a supper at the expense of their employers.

According to Dr. E. D. Clarke, a like custom prevailed at Cambridge. "At the feast of the Hawkie," he observes, "I have seen a clown dressed in woman's clothes, having his face painted, his head decorated with ears of corn, and bearing about him other symbols of Ceres, carried in a waggon with great pomp and loud

shouts through the streets, the horses being covered with white sheets; and when I inquired the meaning of the ceremony, was answered by the people that they were drawing the Harvest Queen."

At different places different ceremonies were observed. The farm labourers of Windsor, for example, crowned with flowers their last load of corn. They had also a richly-dressed image which signified Ceres. This they carried in procession, every one shouting as loudly as possible, until the cart containing the image arrived at the barn. The festival incident upon the completion of the harvest was called, in Herefordshire and Shropshire, "Crying the Mare;" in Yorkshire, a "Harvest Dame;" in Bedfordshire, "A Jack and a Gill;" in the Isle of Skye, "The Cripple Goat" (*an Gaobbir Bhacagh*); in Scotland, "Corn Lady," or "Maiden;" in Cornwall, "Mell-Supper;"* and in France, "Harvest Gosling." This consisted of the last handful of corn reaped in the field, which was contrived to fall into the hands of the finest girl, who was called the "Queen of the Feast." It was gaily decorated with ribbons, and carried home in triumph, accompanied by the music of bagpipes; then arranged in the form of a cross, and hung up, with the date of the year, in some conspicuous part of the house.

Newton, in a work entitled "Tryall of a Man's owne Selfe," published in 1602, under the head "Breaches of the Second Commandment," severely censures "the adorning with garlands, or presenting unto any image of any saint, whom thou hast made special choice of to be thy patron and advocate, the firstlings of thy increase, as *corn* and *graine*, and other oblations."

Perhaps one of the most curious harvest superstitions prevailed in the Western Islands of Scotland. One day during each harvest season the rustics scrupulously refrained from labour, actuated by a time-honoured, but foolish, belief that if they *did* work the ridges would bleed!

In a quaint book by Tusser, entitled "Five Hundred Points of Husbandry," the following lines occur, bearing especially upon the "In-gathering of Harvest."—

> "In Harvest time, harvest-folke, servants and all,
> Should make altogether good cheere in the hall,
> And fill out the black bol of bleith to their song,
> And let them be merie al Harvest time long.
> Once ended thy Harvest—let none be begilde,
> Please such as did please thee, man, woman, and child;
> Thus doing, with alway suche help as they can,
> Thou winnest the praise of the labouring man."

S. Phillips Day.

* From the ancient Roman sacrifice of mingling the new meal.

ALGERIA AND ITS FOOD RESOURCES.

Probably no part of the old world is better adapted than Algeria for becoming a food-producing country, and for the acclimatisation of the vegetable products of other regions. Its climate presents every temperature, from the coldest to the hottest; its soil is greatly varied; while its means of irrigation are considerable, and are being constantly augmented.

Politically, it is divided into three provinces—Algiers, Constantine, and Oran; but, with reference to its food capabilities, it may conveniently be separated into four regions, very distinct as to climate and productions:—1. The Mediterranean region; 2. The mountain district; 3. The high plateaux; 4. The Sahara.

The first, in consequence of its affinities with the countries on the north shore of the Mediterranean, must ever be the centre of European colonisation, and the most highly cultivated as well as the most productive portion of the colony. Its mild climate suits more especially the animals and culture of the South of Europe; while its almost entire exemption from frost permits the naturalisation of many valuable tropical fruits, vegetables, and other plants of economic value. The orange tribe, the guava, alligator pear, cherimolia, loquat, etc., are grown in abundance; as are also the sweet potato and numerous other tropical vegetables. Early vegetables are largely produced for the Paris market; and, if these do not reach London, it is merely because no regular and sufficiently expeditious means of communication exist between the two places.

The mountain region presents conditions more advantageous for the staple productions of the centre of Europe, especially for the vine and the olive. There also occur the almond, chestnut, and walnut trees, while on the slopes of the higher Atlas are found the wild strawberry and gooseberry. Cultivation on the high plateaux can only be practised within narrow limits, in localities cool and capable of irrigation. The pasturages of immense uncultivated regions are particularly adapted for cattle breeding; and still more extensive tracts of land, where the forage is too poor for this purpose, produce in abundance delicate aromatic herbs well suited for rearing sheep and goats.

The Sahara forms the southern boundary of the high plateaux, and extends to the great Central African desert, of which indeed it is a portion. The date is the principal product; but vegetation of any kind is only possible where the presence of water constitutes an oasis. There is no reason why the number of oases should be limited by the occurrence of natural springs; in almost every part of the Sahara artesian wells may be sunk with success, and wherever water is found, the date tree flourishes; so that it is not unreasonable to hope that dates may become, not only one of our cheapest luxuries, but a palatable, nourishing, and widely spread article of diet.

France is the principal market for the food products of Algeria; thither go its cattle, cereals, and oil; and it is only in seasons of great plenty there, and of scarcity elsewhere, that a portion finds its way to England, Italy, Belgium, or Spain. The facilities for bringing produce to the coast are still very insufficient; railways and roads are being constructed in the more settled parts of the country, but, in the interior, the total absence or wretched condition of the means of communication necessarily limits the food-producing power of these regions to the requirements of the inhabitants.

It is not easy to give accurate statistics of the yield of cereals in the entire colony. My remarks will have reference chiefly to the province of Algiers, which comprises, roughly, a third of the whole extent of territory, with a population of not more than 200,000 souls. During 1869, more than seven and a half million bushels of corn were there produced, and one million and a quarter of other agricultural produce, such as beans, maize, etc. Algerian hard wheat (*Blé dur*), being particularly rich in gluten, is well adapted for the manufacture of macaroni, and other substances known under the name of *pâte d'Italie*. In this respect it rivals successfully the productions of Sicily and Taganrog. Barley constitutes the food both of men and horses in many parts of Algeria, and is largely and profitably cultivated all over the country. Oats have not hitherto been grown on an extensive scale, but they are beginning to find greater favour with the colonists. This grain, especially when sown early, is suited for soil which is too poor for the growth of barley; and, as it ripens before the latter, there is less danger of its suffering from drought, or from the influence of the hot sirocco wind which prevails in autumn. Algerian oats have this year been sent to Marseilles before they could reach that market from any other quarter, and they sold for 23 fr. per 100 kilos., while wheat was only worth 30 fr., and barley from 15 fr. to 16 fr. Rice might perhaps be grown in some parts of Algeria, but the cultivation of it

is insalubrious, and requires too much water, which can be more profitably employed in other ways. Sorgho and millet are largely cultivated in the interior for the food of the people, especially in the mountains of Kabylia. They are sown in May, when other grains have been long in the ground; they require no irrigation, and ripen when all other cereals have been gathered in, and even threshed. Their green stalks are invaluable as food for cattle when the grass is burnt up by the heats of summer. Sorgho may also one day be usefully employed in the manufacture of sugar. Indian corn too is a deservedly favourite crop inland, where irrigation is practicable. From the sea coast to the furthest oasis of the Sahara, it produces abundantly, and probably yields a greater return than any other cereal.

Fruits are not cultivated as much as might be the case, were there improved facilities for exporting them to remunerative markets, though they form, as it is, a very large portion of the food of the people, both in a fresh and in a dried state. The fig is as important an element in the food of the Kabyle as the date in the dietary of the Arab. Olives are grown principally in the mountainous region extending between Morocco and Tunis, at from 1,200 ft. to 2,500 ft. above the sea; at a less elevation the fruit is not only inferior in quality, but in quantity. That portion of the Atlas range which runs through the province of Algiers produced last year 50,000 tons of the fruit; while, during the first quarter of the year, upwards of a million pounds of oil were shipped at the port of Algiers alone. The locust, or kharoub tree, is destined to become one of the most important products of Algeria,—perhaps for sugar, certainly for feeding cattle. What is very much wanted in this country is some remunerative arborescent culture; and nothing appears better adapted to the climate, or the requirements of the colony, than this valuable tree.

The time is not far distant when Algeria will become an important wine-producing country. It will furnish not only sufficient for its own consumption, but its wine will compete with the finer vintages of France and Spain. The chief faults requiring correction are:—1. The mixture of plants in vineyards; 2. The want of attention to the proper kinds of vine for each climate; 3. Careless fabrication; 4. Want of proper cellarage; and 5. Precipitation in bottling. Before the French conquest, the natives only cultivated the vine for the purpose of eating its fruit, and up to the present day they have not improved their defective system of cultivation. Even in European farms much yet remains to be done. The colonists of Algeria, coming as they do from nearly all the countries of Europe, are naturally inclined to introduce the mode of vine-culture, and

fabrication of the wine, with which they were familiar in their own country, without the slightest regard to its suitability to their altered circumstances; this defect is now understood, and will, consequently, be remedied. In the province of Algiers about 17,000 acres are under cultivation with vines, though a great proportion of the surface is not in full bearing. This area produced during the past year about 1,350,000 imperial gallons of wine, generally strong and well flavoured. The cost of planting vines varies from 4*l.* to 9*l.* 10*s.* per acre, and an annual charge of 2*l.* 5*s.* is required for its cultivation. This ought to produce in the plains about 350 gallons, and in the hills 200 gallons of wine, when the vines have attained the full bearing age of five years. Raisins have not hitherto been made to any great extent; but attention is being turned in this direction, and one Spaniard has lately planted 100 acres of vine, entirely for the sake of the dry fruit.

In the same province, in 1867, about 7,390 acres were under cultivation as market gardens. Potatoes are one of the principal vegetables produced; the cultivation of these costs about 7*l.* per acre, which area yields in dry soils from 4,000 to 6,000 lbs.; and, in irrigable land, from 16,000 to 24,000 lbs., in three successive crops. The production, however, is very uncertain, owing to disease and sirocco, and the seed has to be renewed from Europe every year. Potatoes sown in March, and gathered in June or July, sell at from 6*s.* 8*d.* to 8*s.* 4*d.* per cwt. Those planted in August and September usually fetch nearly double these sums. Sweet potatoes produce from 6,000 lbs. to 8,000 lbs. in dry soil, and from 24,000 lbs. to 32,000 lbs. per acre, in irrigable land. Artichokes yield from 30,000 to 40,000 heads per acre, and sell for exportation to the Paris market at about 2*s.* per 100.

As regards animal food, no change whatever has taken place in the quality of beasts belonging to natives since the French conquest. Their sheep and cattle receive no particular care; consequently, during seasons of drought or rigorous winter, the loss amongst them is immense. The natives even refuse to avail themselves of the use of European bulls and rams, which the Government has placed at their disposal, on the plea that the products are less capable of resisting the privations incident to Arab life. Europeans have found it advisable in the present state of the colony to take the Arab cow as a base for their operations. They are small, but well proportioned, quiet, and hardy; they calve with great ease, and rear their young amidst numerous difficulties, caused by the vicissitudes of climate, insufficient pasturage, and total want of care on the part of the owner.

By judicious crossing with European breeds, and increased attention to food and shelter, one has not long to wait for an excellent breed of cattle. Little care has hitherto been paid to the feeding and fattening of cattle. Algerian beasts have the property of acquiring fat very easily; and colonists and Arabs have hitherto contented themselves with sending their herds out to pasture during the day, and giving them a little straw or hay on their return at night. Many intelligent Europeans have now commenced to devote their serious attention to the amelioration of breed, and improved means of fattening. Lean beasts sell at from 25*s.* to 35*s.* per cwt., and fat ones at from 35*s.* to 50*s.*; calves realise from 60*s.* to 84*s.*; sheep from 35*s.* to 40*s.*; lean pigs from 40*s.* to 50*s.*, and fat ones from 60*s.* to 80*s.*

The following are the principal articles of food shipped at the port of Algiers during the year 1869:—

Cattle	No.	23,443
Sheep	,,	351,451
Lard and Suet	lbs.	500,000
Fish	,,	3,250,000
Wheat	Qrs.	128,700
Barley	,,	102,800
Flour	Cwt.	76,700
Bread and Biscuits	,,	240
Vegetables, dry	lbs.	1,600,000
,, fresh	,,	2,500,000
Fruit, dry	,,	970,000
,, fresh	,,	1,500,000
Olive Oil	,,	1,800,000

R. L. Playfair.

It is satisfactory to learn that a Poultry Market is in contemplation, the proposed site being a piece of vacant ground adjoining the Metropolitan Meat Market. This would be a valuable addition to our already existing organisation for the supply of animal food. Next, we should like to see good and cheap vegetable markets, in which the poorer districts of London are sadly deficient. Perhaps the formation of one for poultry will cause more attention to be paid to their fattening, from neglect of which we lose an immense amount of good food; and, as a commercial question, it would amply repay any country gentleman to try the experiment, as detailed in the August number of the Journal. Some years ago a Mr. Brooke attended before the Food Committee of the Society of Arts, and gave some very valuable information on the subject, which he offered to make known to the country at large, by going down to various towns on their market days, and instructing the small farmers and cottagers. But no action was taken upon it, as ought to have been the case, and so a valuable opportunity was allowed to slip away.

ON STIMULANTS.

Part III.—OPIUM—Continued.

If we turn to the East, where we might say the use of opium is seen *par excellence*, we acquire a clearer perception of its powers and effects. Here is a description of the *modus operandi* of inhalation, supplied from the lips of one Achin Ahoon, the owner of an opium shop (Chundool shopkeeper), as appended to the report of Dr. Hewlett on the health of Bombay:—"I am thirty years of age, and was born at Macao. I am now a Christian by the name of Sylvester Salvador. I keep an opium shop in the Colbhât Road. I sometimes have fifty customers during the day; they consist of Mussulmen, Hindoos, Purvoes, Banians, Mahrattas, and sometimes also a few Manilla men. I have never seen a Parsee or a European smoke in my house. I buy raw opium at the custom-house, and pay twenty-four rupees for a Calcutta seer. I take a seer of raw opium, and cut it up into small pieces, which I put into a saucepan, and pour on them about seven pints of water. I put the saucepan on the chula and boil the water, stirring it up with a wooden spoon, and continue the stirring for one hour. The saucepan is then taken off the chula, and the mixture is strained though a dungaree cloth into another saucepan. The residue which will not pass through the cloth is thrown away, but the fluid which has passed through the cloth is then boiled a second time, and left until only four pints remain. It is then very thick, and is put into a jar, being ready for use. When a customer comes, he asks for the quantity he requires, varying from nine pice to one rupee eight annas worth. I always make the customers pay first before giving them any opium. A person who can smoke one rupee eight annas worth would take all day doing so. I supply the opium in a little china cup, and give the smoker a pipe, which is composed of a china bottle with a piece of bamboo thrust into the mouth of it. The bottle has a small hole bored on one side. I also give him an iron pin, pointed at one end, and called in Hindustani 'sick,' and an oil lamp defended from the air by the bottom of a bottle (generally half a soda-water bottle) with the end broken off. The smoker lies on a raised wooden platform matted over, which I have fitted in the centre of my shop. These articles are placed by his side. He dips the point of the pin into the cup containing the opium, and then holds it over the flame of the lamp. The opium

bubbles up, and becomes inspissated. This is repeated until a small ball of porous opium is formed, which is rolled round on the pipe. This is then made red-hot and pushed into the hole on the side of the bottle. The smoke is then inhaled through the stem, and taken into the lungs; and, after a short time, expelled through the mouth and nose. It takes about fifteen minutes to finish a cupful, which would cost about four annas. A cupful holds about eighty minims, and will send a man to sleep. A confirmed opium smoker dares not leave off; if he does, he gets sick and dies. The greatest number of persons come to my shop at eight o'clock at night. I keep separate pipes for Mussulmen and Hindoos. I smoke very little, about one pipe every other day. My father smokes about twelve annas worth, or about forty or fifty pipes, a day. If I were to drink a cupful of the opium, it would kill me, but it would only make my father a little drunk. I generally buy about two seers of opium during the month, and make about twelve rupees profit on every seer, but I have to pay for the oil and the wages of one servant."

The "Fifth Annual Report of the Peking Hospital," by Dr. John Dudgeon, reveals another side of the picture. He says:—"Every year the conviction is strengthened regarding the difficulty of giving up the habit of opium consumption. Men of means will continue to smoke,—those without means may be occasionally driven to the expedient of attempting to throw it off, but relapses are frequent, and at no distant intervals. The Imperial monthly pittance of money and rice to the bannermen, rescues them from absolute misery, and they at least are thus carried on from month to month. All human expedients seem vain; the grace of God alone can restrain men from following this vice. We have made it a rule that pipes must be lodged as a guarantee of good faith. I possess a few, but the greater number who apply for relief are either so poor or so situated that they are driven to the shop, and cannot boast of a pipe of their own. To possess the necessary articles, pipe, lamp, iron rod, small box to contain the raw material, (generally with the character of happiness upon it,) must cost about a dollar. If deprived of their pipe, or if they find it impossible to smoke at home or at their workshop, they have recourse to the opium office. A price is charged for the medicine by some philanthropists in order that a way of escape may be made; but this and other expedients only tend in too many cases to tide them over present difficulties. During the last three years 510 opium smokers have applied for relief, but comparatively few have been reclaimed. It is a powerful habit, a second nature, stronger and more insinuating than

strong drink. I have had numerous professions of cure, but I have learned to receive such with great caution, and the more so, the longer the period in which the drug has been used. To give up the fascinations and associations of the pipe, and to overcome and hold out, even with the aid of foreign medicine, against the agonies, pains, and discomforts which are induced by attempts at reformation, requires great strength of will. After abstinence for months, perhaps, the victims relapse into their old habits. During the last three years I have had four different applications from the same person for medicine to effect a cure. It is oftentimes very difficult to bring home the charge of opium smoking, all the more or less directly or indirectly connected with it or with other faults; and a Chinaman's golden rule seems to be to know nothing of anything, —to mind his own business and let other people's alone."

A writer to the *Medical Times* last year, quoting Dr. Dudgeon, says:—"We have nothing new to add to what we have already written on opium smoking. It still continues to be the barrier to all progress and happiness, spiritual as well as temporal. It is the greatest of all the difficulties to be overcome in the resurrection and renovation of China. If this stumbling block were removed out of the way, it is impossible to predict what a glorious future lies before the country, to the missionary, the philanthropist, and the merchant; but until this is done, nothing is done to the purpose." The writer relates that, on one occasion, a Chinese had dined with him; that the visitor suddenly retired from the table to the fireplace, and, for a few minutes, indulged in an opium smoke, his pipe containing about one grain. He seriously deprecates M. Armaud's suggestion of using from one to ten grains in certain chronic affections of the air and other passages. He says that few habits more insidiously steal on mankind than tobacco smoking, and none perhaps are more pernicious. Were opium smoking to become superadded, health, intellect, and life would be additionally endangered.

Since De Quincy's dreams were

> "With dreadful faces thronged and fiery arms,"

considerable attention has been bestowed on the opium question; and the abuse of the powerful juice has been stigmatised in vivid colours and with emphatic characters. Yet many there be who oft with Milton say—

> "Sleep hath forsook, and given me o'er
> To death's benumbing opium as my only cure."

E. H. Fournier.

PUBLIC HEALTH.

Part VIII.—SANITARY SUPERVISION.—Continued.

In the last article I spoke of central supervision, as carried on by the Privy Council, concluding with *vaccination*. I now continue this examination with

2. *Local Inquiry.*—Epidemics are a speciality of the Privy Council, under the Public Health Act of 1858; the Home Office has nothing to do with them. "I know of nothing but deaths," says the Registrar General (Royal Sanitary Commission), "the Privy Council have their inspectors all over the country, and they deal with diseases, and diseases which are not fatal." There is, however, no systematic quartering of the whole country, analogous to that of the Vaccination Inspectors—each inquiry is special; nor is there any organised communication between the Central Health Office and the various health authorities throughout the country. Mr. Simon has to pick up information as he can. The two inspectors employed for inquiry concerning the public health exercise no *espionage*; they are rather emissaries to examine into the truth of complaints, to seek the causes that lead to any excessive mortality, or to any special outbreaks of disease. A note, telling of an outbreak of fever, comes from a local registrar to the Registrar General, and is sent on to the Privy Council; or a complaint is sent up to the Local Government Acts Office, which Mr. Tom Taylor passes on in a friendly way; or a report may be made about drainage, and fever is incidentally mentioned as a secondary consideration. Again, somebody may address the Privy Council direct on the outbreak of an epidemic. More frequently, no information is given beyond that afforded by the published death-rates of the Registrar General's Quarterly Report. People are afraid of frightening visitors away from a place, and registrars have been given to understand that they must not communicate awkward facts. Winterton had suffered for seven years from typhoid (Report 10, Medical Officer of Privy Council); at Terling the epidemic had reached its height before any information was given to the Central Office (Report 10); diphtheria had been two years as an epidemic in England, before the Government knew anything officially about

it. Was ever an army so disorganised as that which England equips to fight against preventable disease? Did ever a general take the field so entirely destitute of reliable information regarding the movements of the enemy? But suppose a detachment to have been discovered committing its ravages in some secluded hamlet, and decimating the people; let the general himself inform us how he will deal with it.* "Here is an epidemic of fever; we inquire into it, and we say that this epidemic of fever depends upon the pollution of water, or depends on the absence of means for the removal of excrement; we are able to satisfy the local authorities of the connection of cause and effect; we trace it up to that point, and then the local authority is challenged to show how it can get rid of that nuisance." If they choose to employ a competent person and abate the nuisance, well and good. "It is the absence of the nuisance that the Government has a right to claim"—it has no right to dictate the special means by which it shall be effected. But if the local authorities are still supine, as they are sometimes apt to be—"Supposing that the nuisance is not abated, Government enters on the second stage of the transaction. I should address the Home Secretary, saying, 'This local authority does not abate its nuisance; will you take skilled advice as to the agency to be employed, and order accordingly?' The business then becomes the work of a different office, and a different class of officers." We shall meet with it again when I come to speak of the Home Office.

In Report after Report, since the year 1858, the same sad story is repeated by Mr. Simon, with certain well known variations. Villages decimated by fever and other zymotics; the strongest and healthiest lives sacrificed to neglect of the most ordinary rules of health. The polluted well, the untrapped drain, the neglected cesspool, would seem to be the tripod from which the fever-fiend surveys his fatal work. But side by side with these isolated inquiries will be found a series of systematic and most valuable investigations into the causation of disease. Those on the sanitary conditions of certain trades and professions are specially worthy of notice—such as dressmakers (Report 6, Medical Officer of Privy Council), tailors (R. 6), printers (R. 6), rag traders (R. 8), bone boilers, cat-gut makers, and other offensive employments (R. 9). Other reports are more general, such as the results of impure water and bad air in the diarrhœal districts of England (R. 2), high death-rates from lung disease (Rs. 3 and 4), excessive mortality of children (R. 4), conditions of nourishment among the poorer classes (R. 6), sea

* Report of Sanitary Commission, 2, 1856.

scurvy in the merchant service (R. 6), dangers in the sale of drugs and poisons (R. 6), dwellings of rural labourers (R. 7), various outbreaks of cholera (R. 9), analysis of sickness in Islington during 12 years (R. 11), and many more. Mr. Simon also informs us, in his evidence before the Sanitary Commission, that he examines suspected water.

3. *General Scientific Inquiry.*—But perhaps the highest function of the medical department of the Privy Council consists in the institution of original scientific investigations concerning the distribution and remoter causes of disease.

Reports of the highest scientific value have issued from time to time from the Health Office. Dr. E. Smith's paper on dietaries and the economics of diet (R. 5); Dr. Bristowe and Mr. Holmes on the hospitals of the United Kingdom (R. 6); Dr. Thudichum on the parasitic diseases of quadrupeds used for food (R. 7), on cholera chemically investigated (R. 9), and on the chemical identification of disease (Rs. 10 and 11); Dr. Sanderson on the communicability of cholera (R. 9), and on the inoculability of tubercle (Rs. 10 and 11); Dr. Buchanan on the distribution of phthisis as affected by dampness of soil (R. 10),—are all models of research, and contain the most complete information on the subjects of which they treat.

4. *Quarantine.*—As a medical question in England, this is all but obsolete; it is retained by the Board of Customs in deference to commercial interests, and the requirements of foreign governments; but Mr. Simon is seldom consulted, and action is still more rarely taken in the matter.

5. Mr. Simon is the accredited adviser of Government in all matters connected with the Public Health.

To complete this short enumeration of the duties of the medical department of the Privy Council, its supervision of curative medicine, through the Medical Council and the Pharmacy Acts, may be mentioned as having a less direct, but no less important, bearing on the Public Health than the functions which have been already mentioned.

6. *The extraordinary functions* of the Health Department of the Privy Council are exercised under the Diseases Prevention Act of 1854; a true Public Health law, providing for times of threatening or outbreak of serious epidemic disease. In the words of the Act, "Whenever any part of England appears to be threatened with, or is affected by, any formidable epidemic, endemic, or contagious disease, the Lords and others of Her Majesty's most honourable Privy Council," etc., may bring special machinery to bear under

this Act; they may issue directions and regulations "for speedy interment of the dead, for house to house visitation, for the dispensing of medicines, guarding against the spread of disease, and affording to persons afflicted by, or threatened with, such epidemic, endemic, or contagious diseases, such remedial aid and accommodation as may be required." As may readily be supposed, such plenary powers are rarely put in force; in the present state of the law the danger of an unreasonable panic might outweigh any benefits which could be conferred by the Act. The Privy Council, therefore, in ordinary cases, contents itself with inquiry and advice, which are always at the service of local authorities and of the Poor Law Board, with special reference to hospital accommodation and vaccination matters. Great emergencies, however, may arise, and then the Act can be put in force by an order of Council within six hours of an alarm. It was enforced during the cholera epidemic of 1866; and full particulars of the regulations and proceedings taken under the Act will be found in Mr. Simon's ninth Report, which is well worthy of careful perusal.

2. Board of Trade.—By a curious anomaly, not unusual in health matters, the analysis of the metropolitan water supply, and the responsibilities connected with it, would fall in cholera times on the Board of Trade, thus making it an important health authority. A complaint against a water company by a certain number of householders would be investigated by the Board of Trade. The administration also of the "Alkali Works Act," an important provision for health, comes under this department, and still further connects it with the sanitary supervision of the kingdom.

E. T. Wilson.

(TO BE CONTINUED.)

At the Volunteer Artillery meeting lately held at Shoeburyness, the mess was daily supplied with Captain Warren's patent meat biscuits, which are made of flour, with a little bran and lentils, enclosing a central layer of Liebig's extract of meat. One of these, put into a pint of boiling water, produces a pint of good beef tea, together with a soft biscuit as an accompaniment. Two, put into a pint and a half of water and boiled for five minutes, make a pint of the strongest broth, which, when cold, turns into a jelly, in itself very pleasant and nutritious. As an experiment, three biscuits were placed in a steamer, and subjected to steaming at 7 lbs. pressure to the inch, whereby they were reduced to such a pulp that they had to be lifted up by a fish slice. They were then placed for seven days exposed to the air, in a box, which was afterwards plastered over with paper, and kept for 45 days more. When opened, the biscuits were perfectly fit to eat; and, instead of being mouldy, had dried and hardened to their original condition.

POPULAR FOOD ANALYSIS.

No. 8.—TEA—Continued.

We will now take a glance at the black tea manufacture. On arrival at the hong, the sun-dried leaves are thinly spread out as before on large shallow trays or mats, and frequently tossed about in the sun's rays. The result is, that the combined action of the sun and air partially dries and darkens the leaf, thus hastening the formation of tannic acid, on which the strength of the subsequent infusion, and of course the value of the tea, ultimately depends; although we may remark that no trace is yet discoverable of either theine or the volatile oil to which the finished leaves owe their flavour. It is usual to have two or three rolling tables at hand, in what may be designated the oxygenising shed, so that the leaves may from time to time be subjected to a continual series of tossings, twistings and rollings. In the manipulating chamber adjoining, the tea passes through the hands of a higher class of workmen, who impart the necessary twist, and subject it to the same process followed out in the manufacture of green tea. But it will be remarked by the intelligent reader that, in contradistinction to the green tea process, black tea, so far, is differently treated by undergoing a long exposure to the air, without being subjected as yet to any artificial heat. Repeatedly handled thus, the leaves presently become moist and flaccid, and are now in the condition most favourable for fermentation. The withering chamber is a long, dark, low-roofed apartment, raised from six to ten feet above the ground, floored with hard timber and covered with unglazed tiles having a hard surface resembling slate. Flues pass under the floor and up the walls, to supply the heat required to promote fermentation when necessary, which happens if the air is unusually dry, or when much wind is blowing. Unlike the generality of Chinese apartments, this one is kept scrupulously clean, the walls and woodwork being frequently whitened with *chunam*, while nothing in the least offensive is allowed to

accumulate outside. Within this chamber the flaccid leaves are placed in separate little heaps, when fermentation is rarely long delayed. The first effect is a perceptible darkening of the heaps, caused by the chemical union of the oxygen of the air with the tannin of the leaves. This is shortly followed by the emission of a slightly fragrant odour, evolved by the volatile oil, which rapidly increases with the fermentation. From one hour to an hour and a half is the time necessary to produce the desired chemical transformation; but so critical is this process, as it reaches its termination, that the slightest neglect or delay in the removal of the leaves may ruin the whole contents of the chamber, and will certainly destroy, or materially deteriorate, the subsequent value of that particular heap in which the action has been permitted to exceed the proper limit. The remainder of the operations resemble those for the manufacture of green tea, and consist in firing, rolling, and twisting; the essential point being the fermentation, as above described. During the last firing an artificial flavour is generally communicated to the inferior teas. The most common plant in use for this purpose is the *Olea Fragrans*, which possesses a high aromatic flavour and exquisite perfume, but there are many others, among which figures the *Camellia Sasanqua*, largely used for adulteration on account of the close resemblance of its leaves to those of the tea shrub. Small bundles of the flavouring leaves, enclosed in white crape, are placed along with the tea during fermentation, and kept in contact with it through the subsequent stages, when the aroma is readily communicated.

As a matter of course, during all the many manipulations which tea undergoes, a large portion gets broken up; and thus, its market value being depreciated, it is necessary to carefully separate the good from the dust. The classifying or picking is invariably done by females, assisted by young boys; and affords perhaps the most interesting and lively picture connected with the manipulation which a foreigner can witness. Seated on low benches in large, airy halls capable of containing with comfort from 500 to 1,000 individuals, the tea pickers may be seen at work, singing and chatting over their pleasant employment. Every encouragement is extended to the grouping of families together. A mother and her daughters, with probably a little boy or two, take their seats, when a coolie deposits a basket containing a picul of tea (133⅓ lbs. avoirdupois) in their midst. Presently their nimble fingers are at work among the leaves, which they separate individually, consigning each quality to one of three receptacles, to a vocal accompaniment of the sweet and expressive melody Moh-li-Hwa, or Jasmin Flower;

a favourite song throughout the tea districts. When the quantity served out has been picked, it is taken by an attendant coolie, accompanied by one of the girls, to the overseer, who inspects the work, pouring each quality down an appropriate shoot if he is satisfied, and handing over another picul of leaves to be operated upon, along with the payment for the last.

The tea has now only to be packed in chests, and sent to the sea-board for exportation.

When tea is considered from a chemical point of view, it is noticed to contain three important constituents, viz., theine, tannin, and a volatile oil. The two latter resemble in their action the similar bodies found in coffee, and already fully treated of in the Journal, but a description of the theine was reserved for the present occasion. This very beautiful substance, which takes the form of silky needles of a dazzling whiteness, can be seen by any of our readers inclined to perform the following simple experiment. Take some tea, and having pounded it, put it in an iron spoon, or a small saucepan lid, and place over it a cone of blue writing paper about four inches in height. Now carefully heat the spoon or lid over the gas, till fumes are seen to escape from the top of the cone, and keep it at this heat for a few minutes. On removing the paper and opening it, the theine will be found adhering in crystals on the upper surface, and can be gently scraped off. The heat should be so regulated that the paper cone does not char. Theine is what chemists call an alkaloid, and, besides containing a large proportion of nitrogen, it possesses exhilarating properties, and arrests the waste of the tissues. It is doubtless to this constituent that tea owes its value as a sustaining and life-giving beverage to the old and infirm, and hence is the gift of an ounce of the fragrant leaf so acceptable to the aged inmates of our workhouses and hospitals. The exact proportion of theine in tea varies considerably, as will be evident from the following results, obtained by Dr. Stenhouse:—

Green Hyson Tea	contains	1·05	per cent.	of theine.
Black Congou	,,	1·02	,,	,,
Black Assam	,,	1·37	,,	,,
Green Twankay	,,	0·98	,,	,,
Black Bohea	,,	0·70	,,	,,
Average Black Tea..	,,	2·00	,,	,,
Do. do.	,,	2·13	,,	,,
Black Kumaon Tea	,,	1·90	,,	,,

By another process, Peligot found as much as 6·21 per cent. in a good sample. The proportion of the other constituents of tea will

be evident from the following analysis of congou tea, given on the authority of Mulder:—

Volatile oil	0·60
Chlorophyll	1·87
Resin	3·64
Gum	7·28
Tannin	12·88
Theine	0·46
Extractive	40·48
Legumin	2·80
Woody fibre	28·82
Ash	5·24
	104·07

The adulterations to which tea is liable may be divided into two classes:—(1.) Those which it suffers at the hands of the foreign makers, before import, and (2.) those which it undergoes in this country. As the latter are the least common, we will dismiss them in a few words. A good deal has been written as to tea manufacture at home from all sorts of rubbish, but we do not believe it to be so prevalent, now that the duty is reduced. In our experience, the chief form of adulteration in vogue at home is the mixing of good class teas with inferior, and the converting of common caper into fine gunpowder, by an ingenious process of "facing" with chalk or *kaolin* and Prussian blue. A case of this kind was exposed in the first number of the "Food Journal."

The adulterations practised before import are more varied and disgusting. They consist in "facing" common tea with deleterious substances, in drying up foreign leaves (chiefly those of the willow) along with tea, and in re-drying leaves which have already passed through the pots of the celestials, and which are doubtless considered quite good enough for us barbarians. A great trade has lately sprung up in this branch of industry, and the result is known as "Maloo mixture." It seems that the leaves are industriously collected and spread out to dry in the sun, when they again become shrivelled, and besides being thus, after a little facing, rendered saleable, they form a most excellent resting place for the pigs and other domestic animals attached to the cottage where the manufacturer resides. On this interesting subject we extract the following from a recent Chinese paper:—"The wonder is that such stuff (tea leaves that have already passed though the teapot, re-dried and coloured) should be allowed to be manufactured, much less to be shipped as a lawful export; for Chinese law expressly prohibits the re-manipulation of tea that has once been used, on the obvious and common-sense principle

that such a trade is necessarily, in its very essence, fraudulent. Yet, in the face of this well-known maxim, it is one of the thousand proofs which we have of the utter rottenness of the present administration, that all round the Settlement, in every convenient open space, large quanties of what is termed with ominous propriety the "mixture" lie exposed to the sun, at noon-day; in some cases within a hundred yards of the mixed court yamen. And not only so, but there are establishments, well known to the police, where the mixture is fired, leaded, packed, sold, and despatched for shipment; and experience has shown that it is useless to expect conviction, under Chinese law, from a Chinese magistrate.

"But we have heard of another phase of this business, which casts new light on the propriety of the term mixture, as applied to this branch of the tea trade. We have hitherto been accustomed to think that the Maloo mixture was at least tea, however drained of the theine principle. But a gentleman, who had occasion to traverse the back part of the Settlement, was led by certain appearances outside, to enter a house, inside of which he found about *five piculs of leaves gathered from that peculiar kind of willow* which grows so abundantly in the country round, and numerous specimens of which may be found sprouting into delicious greenness on the sides of the Bubbling Well Road. One needs not the expensive craft of the *cha-sze* to know how neatly a little skilful manipulation, and a little heat applied *secundum artem* can transform those willow leaves into genuine and delicate tea leaves. Whether the mercantile result be intended to astonish the palates of old ladies in London or Glasgow, or to pass as genuine Souchong with skippers, who have little knowledge of tea, we know not; but the fact remains, that the trade thrives well and pays."

Such then is the history of "Maloo mixture," of which our Government not only permits the importation, but on which it charges a duty precisely the same as that exacted from good tea. In the accompanying illustration will be found a pictorial delineation of this wonderful mixture, which was taken by the artist from a saucer, in which we had spread the various constituents as picked out from the several samples. Everything is represented as it appears in the dry tea except the leaves, which were moistened with hot water to cause them to unfold and show their structure, and also the maggots, which are delineated as seen under a magnifying glass. The magnet is sketched as it appeared when drawn out of sample No. 11, the analysis of which will be given next month.

J. Muter, Ph.D.

[to be continued.]

A FOREIGN CATTLE MARKET.

With an enormous meat-consuming population, London is still very inadequately supplied with markets for the reception and distribution of animal food. The main causes of this are the haphazard nature of our legislation respecting markets, the strength of vested interests, the conservatism of custom, and the want of public spirit to insist on such arrangements as would not only benefit this great metropolis, but would make it, as it ought to be to some extent, the great centre and emporium for the import and transport of foreign cattle for home consumption.

With regard to the transit of stock, very considerable improvements have been recently made, and some of the monstrous evils which have characterised the import and distribution of foreign stock are removed, in theory at least, if not wholly in practice. In this, as in many other matters, our weak point is, not the absence of good laws, but the want of power and machinery to enforce the laws that exist on paper. The cruelty connected with the import of foreign cattle, the serious loss of food through avoidable deaths, and the inadequate arrangements for preventing the import of diseased animals into the United Kingdom, have long formed serious grounds of complaint. Much of this will henceforth be altered by an Order in Council, parts of which took effect on the 31st of July, while other parts will come into operation respectively on the 31st of October and the 31st of December in the present year. Reform will thus be gradual, though still only partial, for it does not extend to Ireland; and to some extent it will be important and effective; but perhaps the chief merit of the new regulations will be that they will prepare the way for the establishment of what is so sorely needed, a foreign cattle market and abattoir. In due time this object will, it is to be hoped, be directly effected under an Act of Parliament passed in the Session of 1869; but there are unaccountable delays in taking advantage of the Act. Meanwhile the Privy Council has ordered that, from the 31st of July last, every place used on board vessels for the transit of animals shall be divided into pens by substantial divisions; that the floor shall have proper battens or footholds; while ventilation by means of separate inlet and outlet openings is insisted on. This is all very well, but a strange order has been made with regard to the

size of the pens. No pen is to exceed 9 feet in breadth and 15 feet in length. In memory of the horrors of cattle-crowding on board ship, it might have been supposed that the order would have been in the other direction, and that arrangements would have been made that the pens should not have been less than such a size. Freshly shorn sheep are not to be carried on deck between the 1st of November and the 30th of April; and, during the period when sheep may be stowed away on deck, proper gangways are to be provided. In accordance with our half-hearted and permissive legislation, none of these regulations, though some of them are supposed to be now in operation, are to be enforced till the 31st of October of this year; and then they are to be carried out by a breach of them resulting in the detention of the animals, under the supervision of the Customs, until the Privy Council otherwise direct. What the Customs or the Privy Council are to do with the animals is not stated. In reference to these and other regulations, it is ordered that "if anything is done, or omitted to be done, in contravention of any of the regulations of this Order," the persons so offending "shall severally be deemed guilty of an offence against this Order." This at first reads like a comic truism, till we come to note that the Order fixes the responsibility on principals and not subordinates,—the owner and the master of the vessel for example,—in accordance with an old legal maxim, *qui facit per alium facit per se.* The regulations for the transit of animals on land are pretty good, though scarcely sufficiently precise. Till the end of the present year, the only arrangements insisted on are, that trucks for the conveyance of cattle shall not be overcrowded so as to cause unnecessary suffering, and that the vehicles shall be thoroughly cleaned after any animal is taken out and before another is put in; while the component parts of the disinfecting fluid to be used are given. At the commencement of next year a further improvement is to be insisted on, and railway companies will have to supply trucks with spring buffers and proper battens or other footholds. To this order is appended a list of about 300 railway stations where the companies "must supply water" for animals carried on the line. It would be interesting to know what arrangements railway directors have made, or intend to make, in compliance with this order; and what railway stations in this respect testify to the docility and obedience of directors.

Any improvement in the transport, reception, and distribution of cattle must be hailed as a boon; but the great want of animal food producers and consumers is a foreign cattle market on an adequate scale. The main requirements are, that the site should

be on the river Thames; that there should be a river frontage sufficient for at least four vessels to unload at a time; that the market should have facilities of railway communication with Smithfield and Whitechapel, the latter being the chief locality for the foreign retail meat trade; that there should be adequate wharf and landing accommodation, with lairs, sheds, market-houses, and offices; and last, though not least, that there should be ample facilities, in immediate connection with the market, for the slaughter of animals, under strict regulations for the public health. At present our arrangements for the import and distribution of foreign stock are notoriously defective; the abuses and evils connected with our foreign cattle supply vary in different places, but nowhere are the regulations what they ought to be. The Contagious Diseases (Animals) Act has considerably mitigated some of the evils that formerly existed, and the Order in Council to which reference has been made must have some good result; but much more remains to be done, and this very Act might be made to effect the desideratum. It confers powers on the Corporation of London, which it has only to exert for the formation of such a market as that advocated. The Corporation indeed, itself rather a vague term, is pretty generally regarded as the proper party to make the selection of the site, and build the market; and it is, we believe, quite within its powers to propose what tolls it thinks proper. It may be questioned, however, whether such powers ought to exist in the hands of any Corporation, Common Council, Markets Committee, Markets Sub-Committee, or any other municipal body or clique.

Food supply is an imperial question, and the Legislature ought to make such broad and general regulations on the subject as would benefit the nation as a whole, without contravening the principle of free trade. The home cattle and meat markets should be separated from the foreign; and special regulations should be made for the latter that are not required for the former. Such a separation would in the end be advantageous to both departments of this important trade. The home breeders, dealers, and salesmen are on the whole in favour of separate and distinct establishments; the foreign cattle traders would be largely benefited by the increased accommodation for and development of their trade; and the public, always more or less afflicted by the dearness of meat, would gain immensely by a larger supply, in better condition, and with improved arrangements for slaughter and distribution. It is strange that the metropolis should have remained so long without so obvious a requirement being met. The Corporation has for years past been

thinking about seeing about something being done in the matter;—a roundabout phrase which suits its dilatory action, or rather its inaction. The principle of *imperium in imperio* has in this matter so far been carried out that from the Corporation we get down as low as a Markets Sub-Committee, to whom, we believe, the question was long since referred. Although very little, if anything, has been done towards establishing a foreign cattle market, a great deal has been said, and there has been ample discussion on the merits and demerits of proposed sites. The old Deptford Dockyard has been proposed, but there were legal difficulties as to title. Deadman's Dock, not far distant, has its advocates, in spite of its unhappy name, and the large outfall of filthy water in the locality. Dagenham Dock, which has notoriously failed in its intended purpose, might be rendered available for landing purposes, while there are acres of desolate land in the vicinity that might be utilised for the desired object. The Victoria Dock Company also have, on the south side of their establishment, many unused acres, which they are anxious to turn to account as grazing ground for the recovery of cattle from the effects of their sea voyage; as well as for the erection of a market, slaughter-houses, etc. In the neighbourhood of Thames Haven, too, there would be scope and verge enough for all that is required. In fact, as to sites there is positively an *embarras de richesses*, as any one can see for himself during a trip down the river as far as Gravesend; more especially on the Essex shore, which on the whole would be the best side of the river for a foreign cattle market. The question of site, however, is undecided at the present time. As the matter stood at the close of the past Session, and probably stands still, the Corporation had selected a site for such a market on the west side of Deptford, and the Privy Council had, and probably has, this site "under consideration"—a phrase that covers a multitude of delays. It may be doubted, however, whether this site is so convenient as others which could be found on the opposite shore, and somewhat lower down the river. Were a limited liability company to take the matter in hand they would not be long in deciding on a site; and perhaps a company would manage the whole affair better than any corporation or committee. But for the prestige and the partial action of the Corporation, a company would perhaps ere this have given us a fine, handsome foreign cattle market and abattoir; and it would be well for city magnates to bear in mind that such a public work is still within the scope of commercial enterprise.

J M. Philp.

FUNGUS EATING.

If we were to search the wide world I do not think that it would be possible to find a nation more prejudiced than ourselves. We boast of our enlightenment and the liberality of our views; but, when we come to the practical, it takes an immense deal of leverage to move us out of our beaten track; and, even in the common habits of our lives, we go on to the end of the chapter, as though there was but one way of doing things.

In the little matters of eating and drinking we are perfect slaves to our cooks; and whether it arises from indolence, timidity, or ignorance, the result is the same—that few of us dare try experiments; whereby a great quantity of palatable food remains unknown and unheeded. This is particularly the case with the class of comestibles which forms the subject of my paper, viz., that of the fungus; the true knowledge and appreciation of which would keep starvation from many a poor man's table (at least during three months in the year), and give the gourmand an additional luxury wherewith to tickle his palate. The apathy, ridicule, or disgust with which a serious proposal to cook and eat fungi is received, is the more extraordinary because so much has been said and written about them; therefore it cannot be altogether from ignorance of the subject. Dr. Badham, Messrs. Cooke, Worthington Smith, Berkeley, and others have expatiated well and fully on the whole tribe of mushrooms and fungi; and, even for those who cannot screw up their courage to the crucial test of eating them, the works of these authorities are full of interest. More recently, too, the great fungus question has been examined in the most practical manner by the members of a Natural History Society in the West of England, called the Woolhope Club, which has its head-quarters at Hereford, and embraces in its scientific investigations all the district between Shropshire and the Bristol Channel. Geology and botany are the main studies of this society, but latterly that of mycology (the study of fungi) has been added, and a most useful and important one it is. One day in each autumn is devoted to a fungus hunt through the prolific woods of Herefordshire, and the numbers that are gathered by this enthusiastic band are something enormous. The labours of the day are closed by a dinner, at which the main dishes are composed of the spoils of the chase, dressed in the most epicurean fashion, and with the most appetising (fungus) sauces; and as I have myself assisted at these Apician banquets, I can vouch for the

delicacy of the viands, and the absurdity which we daily commit of turning up our noses at the good things with which nature has supplied us. But the Woolhope Club does more than eat and talk, for it publishes (though only privately) an annual volume of its transactions, including a description of the fungi of the county, and the best modes of cooking them. These descriptions, and the illustrations which accompany them, are mainly due to the energy and experience of Dr. Bull, of Hereford, who has been the chief instrument in making the Woolhope Club a fungus-eating community, and who rivals Soyer himself in his ingenuity in discovering new ways of cooking his favourite food.

Seriously speaking, however, I consider the endeavour to make the public understand the value of the fungus to the nation so very important, that I shall draw largely upon the Woolhope experiences, as well as those of other writers, in the hope that the readers of the "Food Journal" will really try experiments for themselves. With the uninitiated in such matters there is, not unnaturally, a nervous reluctance in taking the first plunge; for, to the minds of most people, a toadstool is only another word for rank poison, while a puff-ball suggests horrible tortures by inordinate swelling, until the wretched victim bursts. This, I remember, was one of the warnings in early life, not to meddle with suspicious mushrooms. But, although there is some ground for distrust (as there is in most other things), a little enquiry will show how fearfully the danger is exaggerated. The Rev. M. Berkeley gives us a list of 2,380 different kinds of British fungi, and even then does not include those which require a microscope to distinguish their peculiar characters. Out of this large number he ranks ten only as poisonous, and six as doubtful. He does not imply by this that of all the 2,380 every one is eatable—for this is very far from being the case—but simply that they are not poisonous; and that is the first and the greatest point which we have to combat. It is unfortunately the case that some of the most poisonous are the most common; for, as Dr. Bull observes, "there is scarcely a field, and perhaps not a single wood, in the country that does not abound with several varieties of the *Coprinus*, the *Agaricus fascicularis*, the beautifully coloured *Russula emetica*, and several others. But, since they are so abundant, it is peculiarly our province to encourage the study of mycology; and thus lessen the prejudice existing against them all, by clearly showing the means of distinguishing which are good and which are bad. This is a matter of some difficulty, for the scientific differences are too minute for ready distinction. We cannot be guided by the place they grow in; nor can we eat after slugs, as we do after

wasps and birds with fruit, for slugs seem to enjoy the most poisonous kinds. Colour gives no distinction, nor is the smell or taste of the fungus an infallible guide." It is freely acknowledged, therefore, that there *are* poisonous mushrooms, and that, unfortunately, they are exceedingly common; but this is surely no argument for neglecting the far greater proportion of what may be made wholesome food. We might, on this ground, refuse to eat potatoes, because that plant belongs to a family containing virulent poisons. Parsley, too, which is the most familiar garnish that we have, is not regarded with suspicion because the "fool's parsley," which grows in many gardens nearly as freely, is poisonous. We eat horse-radish without thinking twice about it, although a year seldom passes without somebody being poisoned by accompanying their roast beef with scraped aconite root, which is so like horse-radish that it requires a little care to distinguish between the two.

The question, therefore, resolves itself into this, that—whether it be horse-radish, parsley, or fungi—everybody, whether of high or low degree, ought to have that instruction in common things which should make it impossible for such mistakes to happen. While in our public schools we pretend to give instruction in chemistry and physics, it is inconsistent that we should ignore the study of simple geology and botany, the knowledge of which, in strange countries, is of incalculable importance; and the value of such elementary knowledge in schools of a lower class can scarcely be overrated. "A little knowledge is a dangerous thing," is a proverb that is often quoted by well-meaning people, as a warning against this sort of instruction, as tending to make the recipients thereof smatterers, conceited, and presumptuous; but surely, to teach a village child what fungus he may gather for the cottage dinner, without danger of being poisoned, is as useful knowledge as the height of the Himalayas or the date of the battle of Navarino. I am aware that there are plenty of facilities for this teaching in the way of cheap illustrations, such as those by Mr. G. W. Smith;* but I cannot find that such teaching is anywhere made compulsory, or indeed is adopted at all, except in isolated cases.

Foreigners are far before us in appreciating the value of the fungus as a food supply, and notably in France and Italy; although, with a due regard to the public safety, fungi are allowed to be sold only when passed by the inspectors of food: with this regulation we certainly should not quarrel. Mr. Story, in his interesting work "Roba di Roma," tells us that one of the most common articles of sale

* "Charts of Edible and Poisonous Fungi." Hardwicke, Piccadilly.

abstraction of oxygen from the air, and its conversion for the most part into carbonic acid gas, which occupies its place. The atmospheres of towns, confined spaces, and inhabited rooms, from this cause contain less oxygen than sea-side and hill-country air. This test Dr. Angus Smith has applied to the various districts of London. The following table details the results obtained from an examination in November, 1869*:—

Oxygen in 100 parts of Air.

London.—W.C. and W. districts	20·925
,, S. and S.W. districts	20·883
,, E. and E.C. districts	20·860
,, N., N.E. and N.W. districts	20·857
,, Metropolitan Railway	20·700

As yet the examinations have not been extended to many towns. For those examined completeness is not claimed. We compare London, Manchester, and Glasgow. The results are remarkably consistent and instructive:—

Oxygen in 100 parts of Air.

London—Outside, past Clapham	21·020	
,, Open places	20·950	20·942
,, E., and rather crowded parts..	20·857	
Manchester—Outside town	20·947	20·928
,, In town (frost)	20·910	
Glasgow—Chiefly open parts	20·929	20·909
,, The closer parts	20·889	

The total average amount of oxygen in the air of London (Clapham not included) is 20·885 per 100 parts of air. In the Parks and very open places it is higher, as the subjoined figures witness:—

Oxygen in 100 parts of Air.

Belsize Park	21·010
Kennington Park	20·940
Houses of Parliament (terrace)	20·945
Westminster Abbey Yard	20·940
Hyde Park (Sloane Street)	20·925
Hyde Park..	21·005

INCREASED CARBONIC ACID.—The effects of concentration and the arts of man are, as we observe, to decrease the vital air. Instead, there is increased carbonic acid gas. This gas is a product of respiration and combustion, also of fermentation and putrefaction. By some, poisonous properties are attributed to it. Careful chemico-physiological experiments appear to show that it has a baneful effect on the human system, when air containing small amounts of it is respired for some time. There is, however, room to doubt if it exerts much power for evil in the amounts as yet found

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* The Eighth Annual Report by the Inspector (Dr. R. Angus Smith, F.R.S., etc.) appointed under the Alkali Act, of his proceedings during the year 1869, from which this article is mostly compiled.

in town air. It is, nevertheless, a valuable indicator of the state of an atmosphere. The following is a summary of many hundred experiments :—

Per Cent., or, if read as whole numbers, per million.

CARBONIC ACID.

In mines—largest amount found in Cornwall	2·5000
Average of 339 analyses	·7850
In theatres, worst parts, as much as	·3200
In workshops, down to	·3000
About middens	·0774
During fogs in Manchester	·0679
Manchester streets, ordinary weather	·0403
Where fields begin	·0369
On the Thames at London	·0343
In the London parks and open places	·0301
In the streets	·0380
On hills in Scotland from 1,000 to 4,406 feet high	·0332
At the bottom of the same hills	·0341
Hills below 1,000 feet	·0337
„ between 1,000 and 2,000 feet	·0334
„ between 2,000 and 3,000 feet	·0332
„ above 3,000 feet	·0336

The air of the several districts of London, subjected to this test, gives:

Carbonic Acid in 100 parts of Air.

London—W.C. and W. districts	·0411
„ S. and S.W. districts	·0439
„ E. and E.C. districts	·0474
„ N., N.E., and N.W. districts	·0444
„ Metropolitan Railway	·1452

Where the oxygen is high, the carbonic acid is low, and *vice versa*. Comparing as before Manchester, London, and Glasgow, we have:—

London—Outside, past Clapham	·0345
„ Open places	·0394
„ E. and rather crowded parts	·0474
Manchester—Outside town	·0369
„ In town, streets	·0403
Glasgow—Chiefly open parts	·0461
„ The closer parts	·0539

The total average amount of carbonic acid in the air of London (Clapham not included) is 0·0439 per cent. The air of the parks and other very open spots shows a superiority, as in the case of oxygen:—

Belsize Park	·0375
Kennington Park	·0376
Houses of Parliament (terrace)	·0430
Westminster Abbey Yard	·0419
Hyde Park (Sloane Street)	·0382
Hyde Park	·0367

We thus see the tales told by these results. They agree; and we are enabled to trace out, by means of such testing, the crowded districts; and at least to estimate degrees of ventilation.

In looking at the above numbers, the differences are so small that they may seem insignificant. So much of a part per cent. fails to convey their full meaning. Dr. Angus Smith thus demonstrates the method of judging of such results:—

"Some people will probably inquire why we should give so much attention to such minute quantities—between 20·980 and 20·999—thinking that these small differences can in no way affect us. A little more or less oxygen might not affect us; but supposing its place occupied by hurtful matter, we must not look on the amount as too small. Subtracting 0·980 from 0·999, we have a difference of 190 in 1,000,000 In a gallon of water there are 70,000 grains: let us put into it an impurity at the rate of 190 in 1,000,000; it amounts to 13·3 grains in a gallon, or 0·19 grammes in a litre. This amount would be considered enormous if it consisted of putrefying matter, or any organic matter usually found in waters. But we drink only a comparatively small quantity of water, and the whole 13 grains would not be swallowed in a day, whereas we take into our lungs from 1,000 to 2,000 gallons of air daily. The detection of impurities in the air is therefore of the utmost importance; and it is only by the finest methods that they can be ascertained in small quantities of air, even when present in such quantity as to prove deleterious to health.

"We began by assuming very small shades of difference, namely, 190 in 1,000,000; but, if we examine the table (Oxygen in air), we find much greater amounts. Take, for example, the pit of a theatre: we have, by subtracting 20·74 from 20·999, a difference of 2,590 in a million, or 14 times more. And so on we may go to the lowest, where we have 17·2, which taken from 20·999, leaves 3·799, or 37,990 in a million, or 200 times more than the first example."

But supposing that deleterious matter does not take the place of the abstracted oxygen, it must be apparent that there is small range to allow of its loss, without the deficiency proving hurtful. The step from full vitality to the death point is little more than 3½ parts per hundred. If, from a room containing 100,000 gallons of air, we withdraw 2,499 gallons of oxygen, candles would cease to burn; and the depriving it of other 1,300 gallons would render it irrespirable. We know that the effect of continued insufficiency of food is feebleness and sickness, though the food taken be good. Is not a similar effect possible with air of diminished *respiratory* nourishment? All other militating causes being absent, the healthy system can probably withstand without injury a certain deprivation of oxygen; but what degree of resistance can we expect the constitutions of our ill-housed, under-fed poor to display, when surrounded by most of the disturbing causes as yet known to sanitary science? It is evident that we must consider diminished oxygen in the air of any place an evil, and an indicator of the first importance.

G. Manley Hopwood.

[to be continued.]

LONDON DINNERS.

Part VI.

We have now reached the sixth part of our report, founded on visits to a few of the places where Londoners are invited to dine, in various ways and at all prices. Last month we were unable to complete our tour of the city dining-rooms, and must plead indisposition as an excuse. The unpleasantness of having to find fault (although in no case without reason) is in some degree removed by being able to observe improvement in the defects to which we have alluded. Proprietors are apt to be very indignant if deficiencies are pointed out, but they think too little of the frequent though unexpressed indignation of the public, if, as too often happens, carelessness creeps in, and slovenly cookery, service, or attendance, disgusts even a hungry and hurried diner—and that where viands are substantially good, and supplied in fair quantities. We hold it a duty to speak plainly; and, in fulfilment of it, we are glad to say that, at Brother Clemow's or Anderton's Hotel, a recent visit enables us to report a decided change for the better in the napery, and the existence of really good hock in the cellars. But why a careless waiter should, as we described in a former article, dare to jeopardise the character of the house; or why the neatness of the table service should ever be remiss, we do not understand. The provision of complaint-books, in which all complaints should be authenticated by name and address, would, we believe, be of essential benefit. Of course there are houses which appear simply to presume on the endurance of that patient camel, the British public; where cleanliness and simple goodness of food seem to be considered as high-priced luxuries. We must say, in all sadness of truth, that, taken as a whole, the majority of ordinary middle-class dining-rooms are decidedly below the mark. Of the truth that it is quite possible to reconcile a fair profit with reasonable satisfaction to the customer, instances enough could be adduced; and slow as we are at accepting improvements, there are tokens of a steady, though sure advance. The promised restaurant of Messrs. Spiers and Pond, in place of the old White Bear, will, we hope, be a model; but the existence of houses such as the Maison Dorée, Bibra's in St. Martin's Lane, Izant's and Gray's Inn Larder in Holborn, Crosby Hall, Lake's in

Gracechurch Street, the Lombard, and others, affords ground for hope that their successful example will be imitated. We may be pardoned if we express our conviction that the ventilation of the subject in these imperfect sketches will help forward the desired improvements, and do a little to educate the English mind to insist upon comfort and nicety, even in a public dining-room.

Another matter, which, though small, is of great importance, has forced itself on our attention. Like the elephant, whose trunk can uproot a tree, or pick up a pin, the "Food Journal" can deal with the supplies of a nation, or the petty cash of an economical diner. Our experience among the dining-rooms where a charge is made per plate, led us to institute some experiments, and on them to found some rough calculations, as to the relation between the quantities supplied and the prices charged. The result has been, that we are convinced that at many dining-rooms the "plate" contains on an average 2½ ozs. of meat—loss of weight in cooking is about two in five;—it thus appears that many purveyors retail the meat (which is purchased at a lower rate than private buyers can command) at about 3*s.* per lb. for beef and mutton! Again, comparisons made in July of the contents and price of a pound of potatoes in Covent Garden, showed that 2*d.* was a common charge for about one-third of a pound costing 1*d.*; two tablespoonfuls of peas were commonly supplied for the price of a pint; and so with other vegetables. This may perhaps be traced up to the monopoly said to be maintained in the vegetable market. We have reason to believe that in the now, alas, vanished times of peace and plenty of poor France, a proposed scheme of supplying the London markets during the Paris "dead season" was thwarted by the jealousy of certain controllers of our vegetarian supplies. In "Lothair" a solemn blessing is invoked on those who may restore the gardens of Zion! What malison is heavy enough to be pronounced on those who prevent a supply of cheap vegetables to our Babylon?

We have not included in our observations any of the old and well-known "chop-houses." There is something to our mind preternatural in the composition of a man who day after day consumes a chop, year after year assimilating 300 portions of a loin of mutton; and we cannot understand the pleasure afforded by the sight of a huge fire, and cooks toiling to prepare the food which one is to eat. Grill-rooms are indeed found as a department in some houses, as at the restaurant at South Kensington Museum; which is as excellent, as the comfortless cellar where visitors and readers try to feed at the British Museum, is in all respects

bad. The natural history collections are about to be removed; perhaps Mr. Cole will send a cook in exchange, for the trustees clearly do not know where to find one; and a recommendation to the Brompton purveyors might also be given, for the meat at present furnished in Great Russell Street for the refreshment of unhappy victims to the pursuit of knowledge, might be supposed to have formed part of the specimens upstairs. Often have we had to wander forth from the reading-room into the streets, seeking our sustenance, and thus we became acquainted with Izant's, in Holborn. A spacious and well-furnished luncheon bar, characterised by cleanliness and ready attention to the wants of the guests, led into a long, well lit, and well ventilated room, with a domed roof; the boxes were roomy and comfortable; there were no bills of fare to be seen, but a ready manager without delay mentioned the available dishes. We will just quote one dinner. Savoury stewed beef, potatoes and French beans, plum tart, cheese, and a pint of ale, cost 2*s.* 1*d.* The quality of each article was good, while the quantity was in equitable proportion to the charge. Izant is a well known city name, and the Holborn offshoot certainly maintains the family reputation.

Gray's Inn Larder, in Warwick Court, was also visited by us, and found worthy of a very good mark. The boxes certainly are angular, and remind one of those exquisitely uncomfortable seats which seem to be an essential part of the machinery for the administration of justice in English courts. The evident legal relations, as lawyers and clients, of all the guests, helped to strengthen the forensic illusion, and one felt as if on one's oath, when cross-examined by the waiter; but the comestibles and potables are good and cheap, and the house has, as it deserves, a well established renown.

We noticed, *en route* for the city, an invite of "a good dinner for 5*d.*," but resisted the temptation; and we also marked frequent offers of "a glass of Alton ale and sandwich for 4*d.*" The intimation that these houses were established, like drinking fountains, for the benefit of the people, is not borne out by the results. We had the curiosity to test the boon thus offered, and found that the traditionary Vauxhall sandwich is still to be had there in all its tenuity.

We were anxious to try another Cheapside dining-room, and so went on to Read's. Outside, a sort of time-table announced a succession of joints, at very moderate prices—7*d.* and 6*d.*; soups and fish were rather dearer, but according to the scale suggested by the meat prices. Practically all were dear, taking the quantity supplied into consideration; and the quality was

decidedly coarse. There was an aspect and atmosphere about the long room—with its comfortable seats, divided by arms, running all round it—that irresistibly reminded us of the saloon of a large steamer; but the fare and service in no degree recalled that of an ocean-going palace—rather did it resemble the discomfort of a coasting vessel. We felt as if we should get under weigh presently, and hear the thumping of the shaft, and the creaking and jarring of lamps and swing-shelves; so we called the steward—we mean the waiter—and disembarked in Cheapside; not without a sense as of having been beforehand with a coming qualm.

Donald's, in the Poultry, has handsome and well appointed luncheon and dining rooms on the ground and first floors. It is an expensive place, the principle being "2*s.* for joint dinner." We looked in one day, and finding the alternative lay between roast beef and ducklings, walked out again, remembering the old proverb, "very little meat and a great deal of table-cloth."

The prices are a little high in some respects at the "Lombard"—the very name smells of money—but the thoroughly substantial goodness of everything supplied makes the prices practically fair, just as the reverse obtains at many cheap houses. The proprietor is our old friend of Crosby Hall, and there, we know, prices are cheap enough. We observed one item worthy of record—a plate of meat is charged 1*s.*, while a "follow plate" is offered for 3*d.* The first was abundantly sufficient for us, though we feel as if we had committed a dereliction of duty in not testing the practical meaning of the offer. The city men seem thoroughly to appreciate the comforts of the really handsome rooms of the "Lombard." Joint, vegetables, cheese, and beer, cost us 2*s.* 2*d.*; with complete content to follow.

We noticed, in descending Ludgate Hill, through the archway leading to Pilgrim Street, a bright new-looking house, the front gay with flowers and plate-glass. An announcement of "Easton's Larder" invited weary wayfarers to turn in and rest; so we did, and found a tiny neat luncheon-bar on the ground-floor, and a small dining-room, where twenty would constitute a crowd, above. At one end, a staircase apparently led to a second-floor dining-room, for a damsel in brown rushed unceasingly up and down the stairs, and showed wonderful activity. The place is too new to have a license, and depends for its liquids on the "Ludgate Coffee House." The solids were cheap; the evident desire to do the best under difficulties disarmed criticism, and we hope that the small beginning may grow into a flourishing concern. We noted this unpretentious candidate for the support of easily contented customers,

because it was at once so new looking in its exterior, and so homely in its interior arrangements.

A substantial old-fashioned eating-house is Dickenson's, in Fleet Street, where men dine by day, and argue in a "Discussion Forum" by night. Of its appearance we say nothing, for it is about to undergo the renovation which it requires. It is rather of the plain and mediocre, but liberally managed class. As we sat and discussed a very sufficient supply of good and solid steak pie, we read the collapse of the Empire before the advancing might of insulted Germany; and then, as we asked the visitors of the Forum, learned that Louis Napoleon had often been present there at the discussions, at the time when, as an exile, he brooded over the dream of future power—that power which is now "a portion and parcel of the dreadful past." But we have not to moralise over the histories of London dining-rooms, but rather to bring to an end our record of experiences, which we trust have proved more useful to our readers than the acquisition of them has been agreeable to us.

W.

A WAR BILL OF FARE.—M. Edmond About, who was almost a prisoner in his own house close to Saverne, and, being cut off from all communication with his friends, was supposed to have been killed or made prisoner, has given in the Paris paper *Le Soir*, a graphic account of the events of the war in that quarter. Amongst other things, he tells us, that when the 11th corps of the Prussian army entered Saverne, the following list of requirements was handed to the mayor of the place:—10,000 loaves of bread, weighing 6 lbs. each; 60 bullocks of 500 lbs. each (killed); 8 tons of rice, 1½ ton of roasted coffee, ½ ton of salt, ½ ton of tobacco, or 180,000 cigars, for the soldiers; 75,000 fine cigars for the officers; 15,000 litres of wine—namely, 10,000 for the men, 5,000 of superior quality for the officers, and 200 bottles of champagne; 2 cwts. of sugar for the ambulances; ½ cwt. of extract of meat, or *tablettes de bouillon* (portable soup). Dry forage—60 tons of oats, 25 tons of hay, 25 tons of straw. Half to be delivered on the same day, and the remainder at six the next morning; and 100 carts were ordered to be provided for the conveyance of the food and forage. In case of the rations not being forthcoming, money equal to their value, with 25 per cent. in addition, would be required, and, in case of necessity, enforced. Saverne contains less than 6,000 inhabitants; and where they found, if they did find, all the above supplies, is not explained.

A REMARK made in the Report of Professor Ferguson, on the importation of foreign cattle into Ireland, is worthy of being remembered. He says that frequent objections are made by consumers to the meat of foreign imported cattle, on account of its dark colour, and unfitness for salting; which, many think, are owing to the age of the cattle and the peculiarity of their feed. But the Professor's opinion is, that the principal causes arise from their being kept in a state of semi-suffocation and general inflammatory congestion between decks, during the voyages of the steamships in which they are imported.

FOOD SUPPLIES FROM THE ANIMAL KINGDOM.

Part II.

Of birds, almost all are fit to be used as food, except the rapacious birds, as eagles, hawks, and owls, of which, although the flesh is not perhaps unwholesome, it is, like that of carnivorous quadrupeds, unpalatable. No considerable supply of food, however, is derived from any of the orders of birds except two; the gallinaceous and the web-footed birds. To the former belong the common fowl, the turkey, the guinea fowl, pheasants, grouse, partridges, quails, etc. Pigeons are commonly ranked in this order, although differing so much from the rest as to be made a distinct order by some naturalists. The relation is like that of the horse and ass tribe to the pachydermatous order of quadrupeds. Almost every species of the gallinaceous order is excellent for the table; and they are very numerous and widely distributed in cold, temperate, and tropical regions, both of the old and new world. Probably the domestication of some of those which have not yet been domesticated might be attempted with advantage; and others might be introduced into this country, as the pheasant and the Virginian partridge have been, to add to the variety of our game. The economic advantage, however, is not quite so certain. Our grouse and partridges probably contribute to our food-supplies, as they eat what otherwise might be of no use; but more doubt may be entertained as to pheasants, which issue from their woodland haunts to commit serious depredations on the grain crops. The domestic fowl and turkey are, in an economic point of view, more important than all the rest of the order; and probably the rearing of these kinds of poultry might be profitably carried on to a far greater extent than it has yet been, for the sake both of their eggs and of their flesh. There is much in an agricultural district of which poultry are the natural consumers; and, although they must be shut up during the time of the ripening and harvesting of corn, yet being let loose immediately afterwards, they glean the fallen grain from among the stubble, and rapidly become fat. There are two parts of Europe in which the keeping of poultry is far more extensively carried on than in any other—Bretagne and Pomerania—and in both poultry-farming is found very profitable. We cannot now enter into

the subject; but there seems to be good reason for thinking that poultry have not yet received due attention in this country. It may not be desirable that poultry-farming should become the principal occupation of any district; but an increased attention to poultry would add to the productiveness of many parts of the country. Cottagers might do much in this way; but the keeping of poultry is worthy of the attention of farmers also.

Of web-footed birds, geese and ducks are the most valuable. Geese, however, are very destructive to pastures over which they are permitted to roam; and perhaps it is only in the fen districts that we can ever expect them to be reared in large numbers. Some of the wild birds of this order, winter visitants of this country, are common in our markets; and there are districts in the east of England in which flight ponds and decoy-ponds yield a large return to their proprietors. We need do no more than allude to birds of other orders, as woodcocks, snipes, plovers, rails, ortolans, wheat-ears, larks, etc., which are, no doubt, of some value as delicacies for the table, but which add little to the amount of our food-supplies.

Of the whole class of reptiles very few are used as food by civilised man. The turtle, the frog, and the iguana are the only exceptions; no British species is ever used. The edible frog of France and Austria is a different species from our frog. We import turtles, and esteem them as a luxury. The iguana is never imported, although it is highly esteemed by Europeans as well as others in tropical America, notwithstanding its repulsive appearance.

Fish constitute a very considerable part of our food supplies, and one of which we may reasonably expect a large increase. It is to be regretted that the value of fish as an article of food is not sufficiently and generally appreciated. When in perfectly good condition, it is almost as nutritious as beef or mutton. Perhaps one cause of the comparatively low estimation in which it is generally held is the state in which it so often appears on the table of the consumer, its quality being deteriorated by too long exposure to the air. It has been suggested that we may remedy this by the application of artificial cold, as has been proposed for the importation of meat from Australia. The subject is well worthy of investigation. If actual freezing should be found to injure fish, we might yet be able to bring them to the market from any part of our coasts, by the application of cold of an inferior degree, so that the fish should not be frozen. The result would certainly be a large increase of our supplies, with new prosperity of fisheries in places remote from the chief markets; as on the west

coast of Ireland, where fish of the best quality are very abundant, but where the fishery has been prosecuted with little energy, because of the distance from any good market for the produce. Taking advantage of one or other of the recently discovered methods of artificial freezing, we might also carry on our fisheries by larger vessels than the present fishing boats; and they might remain longer at sea, working in deep water, where the best fish are generally to be obtained. The whole difficulty of deep-sea fishing would be removed, if it were found easily practicable to employ any of the methods of producing artificial cold in the vessels. We might even bring fresh cod from the banks of Newfoundland, which would be much better than the salted and dried cod at present obtained from that quarter. Nor does it seem impossible that we might import many kinds of fine fish from distant parts of the world. The fish of tropical seas and tropical rivers, some of which are of most excellent quality, might contribute to the variety and abundance of our supplies. We might have the gourami from the Mauritius, the paca from the Essequibo, and the arapaima from the Amazon.

The opinion has long pretty extensively prevailed that our sea-fisheries are much exhausted; and it has been urged that they ought to be placed under restrictions as to times and modes of fishing. The recent Report of the Fishery Commission is wholly opposed to all this. It represents our sea fisheries as increasing in productiveness, the abundance of fish on our coasts as in no sensible degree diminished, and the modes of fishing, to which objections have been made, as not at all injurious. There are some people whom this report does not satisfy. Preconceived opinions, particularly after they have been publicly advocated, are not easily relinquished; and there are parties interested in particular modes of fishing, who can hardly be expected to look upon other modes with favour. Thus the long-line fishers of the east coast of England have a natural hostility to beam-trawling; and the seine-net herring fishers of Scotland make a loud outcry against what is called trawling for herring, which is, in fact, circle-net fishing on the same principle upon which the pilchard fishery has long been conducted on the coasts of Devonshire and Cornwall. The long-line fishers assert that beam-trawling is destructive of fish and spawn, and a similar assertion is made by the seine-net fishers as to herring trawling on the Scottish coasts. These assertions, however, they have found it impossible to support by evidence; and the Fishery Commissioners have given their verdict without hesitation in favour of the most unrestricted prosecution of the fisheries. Fish are

extremely prolific, and all that fishermen can take are only removed out of the way of others which perhaps might have preyed upon them. The capture of a cod, ling, or hake, may be regarded as the saving of the lives of many herrings. In streams which afford good spawning ground there are always plenty of trout, whatever number of anglers may ply their art; for fish rapidly increase in size if food is plentiful—pausing, as it were in their growth, when it is scarce, in a way unknown among the higher vertebrates—and when the largest are taken out of a pool, the vacant places are speedily filled, many competitors being ready, and the strongest asserting his claim with success. Our sea fisheries are liable to fluctuations for which naturalists have not yet been able to account. These fluctuations are very great on particular parts of the coast; even when the fishery of one year, viewed as a whole, differs little from that of the years preceding. Shoals of herring are very abundant in particular bays or firths for a number of years, and then suddenly disappear, often for a considerable period. There was a great herring fishery on the south coast of Norway at the end of last century, which suddenly came to a close from the disappearance of the herrings; and the notion of the fishermen was, that they were frightened away by the noise of the cannon at the bombardment of Copenhagen. Herrings became scarce in Loch Fyne immediately after steamboats began to ply there, and the connection was popularly regarded as that of cause and effect; but the steamboats have multiplied, and the herrings have become as abundant as ever. We know too little of the natural history of the herring to account for such fluctuations, which, however, occur also in other fisheries; and in the report of the Fishery Commission we find, for the first time, a probable cause assigned in the case of haddocks in a certain part of the Solway Firth. Haddocks abounded on a bank that was very productive of mussels, feeding on their young. Some accident of tide and storm covered the bank with sand, and destroyed the mussels. The haddocks disappeared; but, after years had elapsed, the winds and waves again removed the sand, mussels abounded on the bank as before, and the haddocks also returned in their former abundance. From this instance we may see how rash is the inference often made from the sudden exhaustion of the fishery on a particular bank, that it has suffered through excessive fishing.

J. MONTGOMERY.

(TO BE CONTINUED.)

The special fruit train on the Illinois Central railroad brought into Chicago 874,495 lbs. of fruit—mostly peaches—between July 29th and August 10th.

THE ECREVISSE.

EVERYONE who knows the French cuisine is aware of the important rôle played by the écrevisse, or fresh-water craw-fish. Not only does this little river lobster supply one of the most delicious soups in the world—the *potage à la bisque*—which that late eccentric man, but capital cook, Soyer, produced wholesale for the armies in the Crimea; but he mounts sentinel in his red coat over *poulet marengo*, and a dozen other plats, and rises to his highest eminence in battalion under the name of *buisson*. No Parisian supper deserving the name, and few dinners, are without a *buisson d'écrevisses*.

Gourmands and even gourmets are not the best economists, and it appears that the écrevisse is getting almost as scarce as the lobster; the sad case has attracted the philanthropic attention of the scientific world, and the "interesting creature" has become a pet of the Academy of Sciences. M. Chantran, apparateur at the College de France, sent a communication to the academy resulting from observations made in the laboratory of comparative embryology of M. Coste, on the little crustacea, whose habits were but very little known. It appears that the coupling takes place in the months of November, December, and January, and that the deposition of the spawn occurs according to the maturity of the eggs, in from two to forty-five days afterwards; the incubation occupies about six months; consequently the hatching occurs between May and July. The first change of the animal occurs ten days after hatching, and the second, third, fourth, and fifth, at intervals of from twenty to twenty-five days, so that the young écrevisse undergoes five changes of carapace within eighty or a hundred days. After this, no further change takes place for six or seven months. Three other changes then take place in three months, making in all eight sheddings of the shell in twelve months. In the second year there are five changes, and in the third year but two. The creature becomes adult after this period, and then the females shed their shells but once, and the males twice, a year; a fact which explains the larger size of the latter. In getting rid of his old armour, the écrevisse places itself on its side; and, by the action of the body, throws off the whole shell in about ten minutes; the act being

assisted, it is supposed, by the secretion of gelatinous matter between the old and new shells. Twelve hours after the shedding of the old shell, the claws of the animal are capable of nipping sharply; and, in twenty-four hours, they have assumed all their strength. The shell of the back remains soft for about forty-eight hours, when it attains its normal rigidity. The young écrevisses remain attached to the false claws of the mother for ten days after they are hatched, when the first change occurs; after this they are dependent on the parent for about ten days more, when they are able to shift for themselves. The communication of M. Chantran enters fully into the question of the fecundation of the écrevisse, and was illustrated by cases containing specimens of the animals at all ages.

A few particulars collected from other sources will be acceptable. The écrevisse is not considered saleable till it weighs from 1½ ozs. to 2 ozs., and fine ones, which weigh from 3 ozs. to 4 ozs., are about ten years old; the maximum weight is about 6 ozs. or 7 ozs.

France consumes annually something like five or six millions of these creatures, and they are becoming exceedingly scarce, mainly in consequence of the destruction of the small ones. It is said that the French supply from the Rhine is reduced to almost nothing. It was in 1853 that the first were imported from Germany, and since that time the demand has nearly exhausted Holland, the Rhine, Baden, Wurtemberg, Hanover, and a part of Austria. The chief supplies now come from the Duchy of Posen, and Siberia. There is in Belgium a species of écrevisse which lives and thrives in tanks, being fed with putrid meat or offal, and attaining a respectable size.

Many English rivers produce craw-fish. Are they not worth the trouble of looking after; and, if possible, preserving?

G. W. Yapp.

Professor Mantegazza, of Milan, to whose researches on coca we have before alluded, has shown that the cultivation of our common herbs and flowers is worth something more to us than arises from the pleasure of inhaling sweet smells. They are in reality great storehouses of health, by evolving quantities of ozone, which is developed by the direct action of the sun's rays; and, in some cases, continues to be evolved during the dark. Clove, lavender, cherry-laurel, narcissus, hyacinth, and mignonette, are mentioned as among the most valuable of these ozonisers; and the Professor points to the improvement that might be effected, by planting these and other flowers and herbs in marshy and unhealthy districts.

THE SANITARY CONDITION OF BIRMINGHAM.

The circumstances involved in an examination of the sanitary condition of the "Midland Metropolis" are unusually complex; and, in very many respects, conflicting. The situation of the town upon the New Red Sandstone, at an elevation of from 400 ft. to 500 ft. above the sea level, is most undoubtedly conducive to the health of the inhabitants; and in this direction, more than any other, we may perhaps look for the key to its comparatively low rate of mortality. One most noticeable feature is the great clearness of the atmosphere, when compared with that of most manufacturing towns; and this is due to the physical formation of the locality. The location of the town upon the great dividing ridge of the water-shed of England, commonly called the "backbone of England," is, when coupled with the general porosity of the soil, most favourable to efficient drainage; and there are but few parts of the town suffering from a surcharge of surface water. There is, it is true, a very serious difficulty connected with the disposal of the sewage,—of which more anon,—but it must be borne in mind that sewage and drainage are in themselves essentially different; insomuch as the drainage from the high ground upon which Birmingham is built, is really the natural feeder of the streams flowing east and west from the midland water-shed; but so soon as the sewage of a large population is sent into these streams as part of the drainage, the water, which was once a wholesome addition, becomes an unbearable nuisance. Hence we find the Corporation of Birmingham at present involved in Chancery proceedings with two of the neighbouring landowners, by reason of the contamination of the River Tame, into which stream the water from the Birmingham sewage works is discharged.

Birmingham has for a long period been favourably distinguished, in the reports of the Registrar-General, as one of the healthiest of our large towns, and it is satisfactory to note that a continuous improvement is going on. During the ten years 1841-50, the mortality per 1,000 averaged, in Birmingham, 26; in the period between 1851-60, this fell to 24·9, and a still further improvement in health

has since taken place. For purposes of comparison, I have arranged eleven large towns of England, in the order of their respective healthiness, as evinced by the annual average of mortality per 1,000 during the ten years 1851-60.

1.	Bristol	23·2
2.	London	23·6
3.	Hull	24·1
4.	Birmingham	24·9
5.	Salford	26·2
6.	Leeds	26·3
7.	Bradford	26·6
8.	Sheffield	27·0
9.	Newcastle-on-Tyne	27·4
10.	Manchester	29·4
11.	Liverpool	30·0

In the next place, I have taken the Registrar-General's returns for the last ten quarters—from January 1st, 1868, to July 2nd, 1870—and again arranged the same towns in the order of their tables of health, with the following result:—

1.	Birmingham	22·6
2.	Hull	23·9
3.	London	24·2
4.	Bristol	24·4
5.	Newcastle-on-Tyne	25·5
6.	Bradford	25·9
7.	Sheffield	26·7
8.	Leeds	26·9
9.	Salford	28·2
10.	Liverpool	28·4
11.	Manchester	29·2

It is a noticeable coincidence that the following towns have exactly changed places with each other in order; Bristol with Birmingham, London with Hull, Salford with Newcastle, and Manchester with Liverpool; but the most instructive mode of comparison is to divide these eleven towns into two groups, namely, (1) those which have improved in health, (2) those which have deteriorated; and to compare their relative rates of improvement and deterioration. This is shown in the annexed table.

1.—*Towns which have improved.*

		Improvement per 1,000.
1.	Birmingham	2·3
2.	Newcastle	1·9
3.	Liverpool	1·6
4.	Bradford	0·7
5.	Sheffield	0·3
6.	Hull	0·2
	Manchester	0·2

2.—*Towns which have deteriorated.*

		Deterioration per 1,000.
8.	London	0·6
	Leeds	0·6
10.	Bristol	1·2
11.	Salford	2·0

We see, therefore, that Birmingham has, during the periods compared, improved more rapidly than any of the other towns named; and the obvious conclusion is, that some commensurate improvement has been effected in its sanitary arrangements. Amongst the improvements made, or in progress, the demolition of many old houses, and the widening of several narrow streets, are especially worthy of mention. Considerable additions have been made to the general system of drainage, and water-closets are becoming more general. Many nuisances arising from pigstyes, and objectionable pits for the reception of refuse, have been suppressed by the energetic action of the borough authorities; and increased attention has been paid to the watering and cleansing of the streets. Formerly the streets of Birmingham were innocent of anything like proper footways. Such footways as existed were paved with large pebbles, about the size of large eggs, locally known as "kidneys." As illustrating the once exclusive use of these "kidneys," which are most painful to walk upon, a story is told of a Birmingham man who, having never in his life previously walked upon a flagged footway, was suddenly called to London on business. On his return, his friends were eager to know what he thought of the metropolis. "Well," he replied, "it's very grand, especially the shops, but the pathways are very bad; they're so smooth, there's no foothold!" This story is doubtless but a bit of sarcasm, but the use of the "kidneys" remains a fact nevertheless. Even at the present time, very many streets are destitute of any other sort of footway, while numbers of others present a curious mixture of ancient and modern work. Of late years, however, the paving of the footways with blue bricks has advanced rapidly, chiefly owing to the exertions of an indefatigable member of the Town Council, to whom the people of the town owe many thanks. A rival scheme for paving the footways with the basalt from Rowley Regis, in Staffordshire, was advanced with great pertinacity by the opponents of the "blue-brick" party. Of the energy with which the rival forces fought the great battle of Blue Brick *versus* Rowley Rag, I should despair of giving any adequate idea—it is sufficient to say that the Blue Bricks carried the day. Beyond the mere comfort of pedestrians, there is a great sanitary benefit in the improvement of the footways. It is impossible to prevent the inhabitants

of the inferior streets from throwing slops and rubbish out into the street in front of their doors. Where the pebble footpaths hold their own, the injurious effects of this objectionable practice are much enhanced by the lodgment of the refuse, and the sinking of the foul water, between the stones.

The number of water carts at present owned by the Corporation is 50, one being a flushing cart. In the year 1869, these carts used 101,692 loads of 330 gallons each for watering the streets, and for flushing purposes. This water was used in the following proportions in each month:—

January	55 loads.
February	8 ,,
March	1,003 ,,
April	12,538 ,,
May	10,982 ,,
June	19,380 ,,
July	28,018 ,,
August	19,013 ,,
September	9,204 ,,
October	1,364 ,,
November	105 ,,
December	22 ,,
Total	101,692 ,,

In 1868 a greater quantity was used, namely, 131,781 loads. In performing the work required for the cleansing of the streets, repairing them, removing refuse, lighting lamps, and similar work, a staff of 531 men was employed in last December. As before mentioned, one of the greatest difficulties in Birmingham lies in the way of disposing of the rapidly increasing sewage of the town. Not only is the quantity annually augmented by an increase of about 2¼ per cent. in the population, but also by the extension of the sewerage, and the more general adoption of water-closets. At present the latter are the exception, but they are fast increasing in number. One peculiarity of the sewage here is the large quantity of acid and metallic salts contained in it, owing to the metal works of the town. This sort of contamination is very hurtful, interfering seriously with the endeavours which are being made to utilise the sewage on the Corporation Sewage Farm. The results achieved upon this farm are far from being what could be wished. In the first place, the pecuniary aspects of the undertaking are not satisfactory; and, in the next, there is the difficulty, before mentioned, of legal proceedings by adjoining landowners. The average quantity of sewage discharged at this farm is about 55 gallons per head per day for every inhabitant of the borough, or about 20,000,000 gallons per day. One great fault seems to be that the area of land under

treatment is not nearly large enough to deal with so great an amount of liquid. In fact, it needs no demonstration that an area of about 130 acres cannot utilise more than a fraction of the sewage of a town of 360,000 inhabitants. So far as has been found practicable, the water has been turned on to the lands of adjoining farmers, and solid manure has been sold to a considerable extent. In 1869, 10,931 tons of sewage manure were sold to farmers; and, in 1868, 13,615 tons. The falling off in 1869 arose solely from greater difficulty in drying the manure, and not from any want of demand. On the Corporation farm the chief crop grown is Italian rye grass, though some wheat is also raised. The total sum realised from the sale of produce was, in 1869, 839*l.* 0*s.* 2*d.*; not a very good result from land rented at 7*l.* per acre. In Birmingham the length of sewers under the control of the authorities is upwards of 101 miles, and about 33 miles yet remain to be finished. The streets of the town form an aggregate length of 183 miles, all but a few yards. Many of them are in a very wretched condition, notwithstanding that, in 1869, nearly 20,000 cubic yards of gravel, nuts, and pebbles, and upwards of 34,000 tons of macadam were used for their repair. Inasmuch, however, as steam road-rollers have been shown in operation here by Messrs. Aveling and Porter, Messrs. Manning, Wardle, and Co., and Mr. W. F. Batho, we may expect ere long to see one or other adopted, and the streets better kept at a less cost. Very few of the streets in Birmingham are paved, the inhabitants generally preferring the greater smoothness and quietude obtainable from the use of macadam.

BEVERLEY FENBY, C.E.

[TO BE CONTINUED.]

A VERY excellent mode of causing fish to retain its freshness for a considerable time, during the hottest weather and a very long carriage, consists in making with bread crumbs and a sufficient amount of strong spirits of wine a paste of moderate consistence, filling the mouth and gills of the fish with it; then wrapping the whole in fresh nettles, and placing outside an envelope of straw. Fish treated in this way has been carried very great distances during the hottest part of the summer in France.

IT is worth notice how rapidly the beet-root cultivation has increased in Prussia,—far above what its most sanguine advocates could have hoped. In 1836, half-a-million quintals were used, while in 1870 this quantity had mounted up to fifty million quintals—the production, in other words, having increased a hundredfold. The increase in the yield of sugar is relatively greater, for whereas at first only 5 per cent. of sugar was extracted from the root, nearly 7 per cent. is obtained now. This fact ought to influence the minds of our large experimental farmers.

DOMESTIC RECIPES.

The Editor desires to appeal to his readers, and especially to the ladies, for contributions of recipes for cheap, tasty, and serviceable dishes, both for poor households and those of the higher classes.

TOMATOES.

Tomatoes, dressed in the numerous ways with which every household cook in France is familiar, but which are but very imperfectly known in England, are most valuable adjuncts in domestic cookery; rendering especial service in that difficult process, the successful dressing of warmed-up meat. A good second-day dish is made with cold beef or veal, cut in slices, and placed in a saucepan with the cold gravy, two onions cut in pieces, a small piece of thyme, pepper, and salt; adding to these, when they are browned, three or four large tomatoes, which have previously been placed in hot water, and then peeled; the whole to stew for an hour.

For TOMATO SAUCE, the tomatoes are boiled for half-an-hour, with a little parsley, pepper, and salt (sufficient water is contained in the vegetables themselves); then put them into a cullender, and, with a wooden masher, press all through but the skin, seeds, and parsley, and place the sauce on the fire again for ten minutes, with a piece of butter the size of a large walnut, and a small pinch of flour carefully stirred into it. This sauce is eaten in France with hot or cold meat, roast, boiled, and fried; with boiled macaroni, *à l'Italienne;* poached eggs, and boiled potatoes; also with a capital plat made from the beef of the day before, viz.:—

RISSOLETS.—Chop the beef small, add ¼ lb. of sausage meat, a little chopped parsley, one egg, and a piece of bread which has been steeped previously in hot water (the quantity equal to a halfpenny roll). When these ingredients have been well mixed, form them into balls, and fry them in butter, which has first been made quite hot, until they are crisp and brown.

Tomatoes cut in slices, and simply fried in butter, are much liked; and also in salad—though uncooked in this case. The sauce can be made, in winter, from the preserved tomatoes; but this of course can bear no comparison with the fresh sauce. The best way of keeping tomatoes so as to preserve their flavour is simply to bottle them whole in salt and water, and close with corks or brown paper coverings.

INDIAN MEAL GRIDDLE CAKES.

TAKE 1½ pint of Indian meal, scalded well with boiling water. Then add a ittle milk, two eggs, a little salt, and a cupful of flour. Bake on the griddle.

BAKED INDIAN PUDDING WITH APPLES.

(A FAVOURITE AMERICAN DISH.)

Pare twelve sweet apples and core them. Have ready 6 gills of Indian meal, mixed with 1 gill of flour, a teaspoonful of salt, a teacupful of molasses, and a little chopped suet. Boil some milk and pour it on to the meal very gradually; then stir in the other ingredients. Pour the whole over the apples, and bake for three hours.

NOTES OF THE MONTH.

At the recent Social Science Congress at Newcastle-on-Tyne (from the 21st to the 28th September), under the presidency of His Grace the Duke of Northumberland, many important questions were ventilated, not the least of which were the questions of Sewage, Sanitary Administration, and Adulteration of Food, Drink, and Drugs. The President of the Health Section was Mr. Rawlinson, C.E., C.B.

A correspondent sends us a revelation about the manufacture of cheap butter, which we would fain hope cannot be true. Indeed, so unsavoury is it, that we should have treated it as a sensational *canard*, were it not stated to have occurred in a business transaction. An enquiry was addressed by a soap-boiler to a "bone-sweater," touching the price of the fat expressed from the bones of dead horses, for soap-boiling purposes. The answer was, that the bone-sweaters could get a better price from the cheap butter makers. There can be no doubt whatever that horrible nastinesses are perpetrated in this trade, and the sooner the system is laid bare, the better will it be for consumers.

Amongst the novelties to which the war has given birth, is a huge sausage for feeding the Prussian army. Of this material, called *Erbswürst*, 60,000 lbs. are turned out daily, or 180,000 portions, of the weight of three portions to a pound. The ingredients are said, by the correspondent of the *Daily Telegraph*, to consist of 15 lbs. of pure fat, dissolved in the operation of cooking; 25 lbs. of meat (beef and pork); 30 lbs. of ground peas, 3 lbs. of roast onions, 2 lbs. of salt, 1½ lb. of pepper and other condiments, with ½ lb. of some special flavouring matter. For use, a third of a pound is dissolved in warm water, and the soup thereby made is reported as being as nourishing as it is palatable.

It is much to be feared that the horrors of pestilence will, ere long, be added to those of war; nor can it be a matter of wonder. The cholera has appeared at Odessa, Rostow, Kertch, and Taganrog, in S.E. Russia; and will in all probability follow its usual track, until it arrives in this country. It is frightful to think of the number of victims which it will snatch from amongst the crowded, ill-fed and wounded populations which now fill the frontier towns of Germany and France. But are we, who are not suffering from these inflictions, ready to meet the cholera if it comes? Is our health machinery in such perfect order, that we can calmly face the epidemic and defy it? We think not.

Mr. J. A. Barral, in his *Journal de l'Agriculture*, computes that the losses of the French farmers in the seven departments invaded by the enemy amount to more than 160,000,000*l.* sterling. He considers that more than 10 millions of acres have been overrun, and that the loss of crops and cattle cannot be less than 16*l.* per acre. Even if peace were declared at once, the results of this terrible war will be engraven on the surface of the country for the next quarter of a century at least.

THE EARL OF DERBY has been lately speaking at Bootle to the members of the Farmer's Society, and some of his remarks on sanitary matters are the more striking, as they touch upon points which are generally overlooked. The true sanitary condition of the country is not to be guaged merely by statistics of mortality, on which so many people rely; we must remember that the physique of the labourer, the health, and what we may call the moral spirit of the working man, are equally sure tests as to whether sanitary science is properly applied. The stunted growth of the operative, the slouching rheumatic gait of the farm labourer, tell tales equally with the Registrar General's report; and we must not, while enquiring into these subjects, forgot the *mens sana in corpore sano.*

IT is scarcely a matter of wonder that our old enemy, the rinderpest, has made its appearance on the Continent, and is fast approaching these shores. Mr. Waller, the secretary for the Home Cattle Defence Association, states, in the *Times*, that animals have been sold in the metropolitan market which were acknowledged by the veterinary officers of the Privy Council to be diseased, notwithstanding that they had been passed as sound by the Government authorities at Harwich; and that we are now receiving numbers of sheep by this route from a large area of country known to be infected with rinderpest. We regret, too, to observe that the health of our home cattle stock is very far from what it should be, and that foot-and-mouth disease is raging with greater virulence than ever. Somersetshire and Dorsetshire are the new fields of attack, while in Staffordshire it has broken out in 91 fresh places. How many cattle must we lose before the agricultural authorities begin to find out that they are trifling with the disease?

AMONGST the little discomforts of life is one which is particularly obnoxious to those dwellers in London who cannot leave it during August and September, and particularly those unfortunate bachelors who are obliged to make their daily meal in an eating-house or restaurant. It is the nuisance of flies, to which some people are so sensitive, that to dine becomes a positive trial, instead of a pleasure. A little attention on the part of the proprietors of dining-rooms would get rid of the evil. In Belgium the butchers use laurel oil on their doorposts and window frames to such good effect, that the flies will not enter the shops. Is not this hint really worth taking?

A VERY interesting article, by Mr. Andrew Murray, is appended to the Seventeenth Report of the Science and Art Department, on the "Food Products of St. Petersburg," to which we shall allude more fully later on. We would, however, quote, as apropos to the present month, what Mr. Murray says about fungi: "Another food product which figures largely in the consumption of the upper classes of St. Petersburg—mushrooms and fungi—deserves more attention than I have been able to give to it. Of one thing, however, there is no doubt, and that is, that all the chief species (I believe I might say all the species) used in this country also occur in greater abundance in Russia, and are equally prized there. The same fauna or flora, with variations arising from the gradual dropping off of some species, and their replacement by other (new) species extend across Europe and Northern Asia from the Atlantic to the Pacific Ocean. The true mushroom (*Agaricus campestris*), the *Morel*, and the *Agaricus deliciosus*, are the most generally used, but a great many others are freely eaten. M. de Solsky has undertaken to furnish me with a list of the edible fungi, which he either has or is procuring for his museum, as well as a similar one of the lichens. When this is received, we shall be better able to contrast the Russian wealth with our own poverty."

The following facts are of interest, although, alas, entirely of a retrospective kind, as they refer to the good old times, which can never come again. During the middle ages, and up to the commencement of last century, the prices of meat were very different to what they are now. In 1229 a whole sheep could be procured for 1*s.*; in 1256, for 8*d.*; in 1313, 5*d.*; in 1336, 6*d.*; in 1449, 2*s.* 5½*d.*; in 1593, 5*s.*; in 1595, best mutton, 14*s.*; in 1618, a leg of mutton, 1*s.* 10*d.*; in 1700, beef, per lb., 1 1/10*d.*; veal, 2½*d.*; mutton, 2½*d.*

The *Boston Journal of Chemistry* says that large factories have been established in New Orleans, Buffalo, and Brooklyn, for making grape sugar from corn. The latter is steeped in weak soda lye, for the purpose of softening the husk and gluten; and is then ground wet, and run through revolving sieves to separate impurities. It is afterwards made to flow through ways or troughs, in which the starch gradually settles as a white powder. The wash water is run into a large cistern, and allowed to ferment and produce a weak vinegar. The starch from the troughs is put wet into the mash tub, and treated with water containing one per cent. of sulphuric acid, for eight hours. The acid is neutralised with chalk or carbonate of lime, and the liquid evaporated to get rid of the gypsum, and afterwards further evaporated in vacuum pans, and run into barrels ready for crystallisation.

OUR EXPERIMENTAL COLUMN.

Under this head will be given a series of short notices on any new articles of diet, or domestic sanitary matters, that may come before us. Being the results of personal experiment, our readers may regard these reports as trustworthy records of the various novelties that claim the patronage of housekeepers.

Chapman's Whole Wheat Flour.—The making of bread from whole wheat has been frequently proposed of late years; and in the first number of the Journal was an article on the subject, detailing the method practised by a M. Sezille, in France. In a sanitary sense, the advantage claimed by using wheat either whole, or pulverised in the shape of flour, is that the bran is retained, and thus the phosphates and the cerealin, in which the bran is so rich, assist the digestion and the nutrition of the consumer; the former because they are an absolute necessity in the formation of bone, the latter because it has a chemical influence in the conversion of starch into dextrine. But bran is frequently declared to be unhealthy, because it irritates the digestive canal; a fact which in many cases is undoubtedly true, and particularly as regards children, whose little internal economies are often of the tenderest. Messrs. Orlando Jones and Co. (the proprietors of the Whole Wheat Flour) assert that this difficulty has been overcome by the very fine and complete grinding of the bran, which can thus be no longer mechanically irritating. Dr. Tilbury Fox strongly advocates its use for children, in a paper read before the British Medical Association, at the recent meeting at Newcastle; dwelling strongly on the necessity of supplying phosphates to the infantile system. We have tried it as simple gruel, which is certainly very much nicer and more pleasant than the ordinary concoction for the sick room; and also in the form of table pudding and pancake. These were not only palatable, but appetising; and, we think too, economical; for one shilling packet furnished a family of three persons with pudding for three days, at an expense, including a few little additions of egg and sugar, of about 1½*d.* a head per meal.

THE
FOOD JOURNAL.

FOREIGN OFFICE REPORTS ON THE ADULTERATION OF FOOD, ETC.—PART III.

OUR article in the last number of the "Food Journal" concluded with Consular Reports from three American cities, viz., Mobile, Buffalo, and Charleston. We now continue the subject with some very valuable communications respecting the food laws of the States generally. Mr. W. Freeman, in his letter to Mr. Thornton, laments the difficulty that he has experienced in obtaining accurate information as to the municipal laws and ordinances. In one instance only, viz., Cincinnati, were the local authorities prompt in furnishing answers; although replies may in due course be expected from St. Louis, Chicago, and others of the large cities.

State legislation on these matters varies very much in the different States; for in some none appears to exist, while in others the penalties prescribed are very severe. Mr. Freeman has judiciously selected those States which, from the amount of their population or the possession of large cities, might be supposed to have had the evils which these laws were intended to restrain brought most prominently before their notice. It is, however, difficult to give a general answer to questions of so broad a nature, because the United States cannot, for such a purpose, be considered as an unit. Every State legislates independently on these subjects; and many of them, in so doing, delegate the power of regulating such matters to the various city or county authorities within their borders. In one particular, however, that of alcoholic liquors, the practice of adulteration is notorious, and almost universal, notwithstanding the severe penalties imposed by the laws of certain States on vendors of these liquors, when mixed with any substance, not even excepting water. This adulteration is a natural and inevitable concomitant of the excessively heavy excise duties which prevailed in this country a short time ago, but which, though still heavy, are now considerably reduced.

In RHODE ISLAND the sale of unwholesome food, and the adulteration of food and drugs with prejudicial ingredients, are punishable by imprisonment up to six months, or a fine not exceeding $200.

In VERMONT the adulteration of medicine is punished by imprisonment in the State prison for not more than two years, or by fine up to $400. The penalty for selling adulterated intoxicating liquors is from $10 to $300 for each distinct offence. For selling diseased or unwholesome provisions, whether food or drink, the penalty is imprisonment in the county gaol for a period not exceeding six months, or a fine up to $300. For fraudulently adulterating for sale or for selling bread or any other article of food mixed with poisonous or injurious substances, the punishment is imprisonment for not more than two years, or a fine up to $300. The Governor is required to appoint an Inspector-General of beef and pork, who is obliged to have a deputy in each county; and there are minute byelaws respecting the salting and packing of these provisions.

In ILLINOIS, any person knowingly selling the flesh of a diseased animal, or any adulterated food or liquors, is fined up to $100, or imprisoned up to three months. There are public warehouses at certain places fixed by the Commissioners, where all beef, flour, hemp, and tobacco are examined by properly appointed Inspectors, whose duty it is to see that each article completely answers in quality to the mark or brand. The barrel or hogshead (if of flour) is marked with the letters S.F. or F. (superfine or fine), and the gross and net weight in figures. The penalty for offering a bribe to an Inspector is $100; and the same, with dismissal, is inflicted on the Inspector who accepts one.

MISSOURI.—Fraudulent adulteration, in this State, of any food, drink, or medicine is a misdemeanour, punishable with imprisonment in the county gaol up to one year, or with fine up to $500. The adulteration of spirituous or vinous liquors, by the use of strychnine or any other poisonous ingredient, is a felony, for which the penalty is imprisonment in the State penitentiary for from two to five years. All persons who wish to sell spirituous or alcoholic liquors have to appear before the County Clerk, and swear not to adulterate their liquors with water or any other substance; and they have further to give a bond of $500, with good security for the payment of all costs arising from prosecutions or violations of this law. The penalty of non-compliance with this requirement (which is constituted a misdemeanour) is a fine of from $50 to $500. This law, however, is not intended to prevent druggists, physicians, or persons engaged in mechanical arts from mixing or adulterating liquors used by them in their business for medicinal or mechanical purposes. No alcoholic liquors imported into the State can be sold unless first inspected and tested by a competent chemist, to be appointed by the Judges of the several county courts.

In MISSISSIPPI the selling of spirituous liquors, prepared according to any formula for adulteration, is punishable by not less than one or more than five years' imprisonment in the penitentiary.

The following are among the regulations of CINCINNATI:—No person shall kill any cow, sheep, or hog that is pregnant; nor shall any animal be slaughtered while it is in an overheated or feverish condition, nor shall the meat of any such animal be allowed to be sold under any circumstances whatever. No cased, blown, raised, stuffed, putrid, impure, or unhealthy meat, fish, or fowl shall be offered for sale as human food. No person shall bring into the city, for sale, any milk, without a permit from the Board of Health; such permit is furnished gratuitously to all applicants, on condition that none but pure and undiluted milk be sold within the city limits, subject to the approval of the Milk Inspector and Health Officer. All milk waggons shall bear the name of the owner, painted legibly and plainly. Everybody who sells milk shall have the name of the dairyman from whom the milk is obtained posted up conspicuously at the place of sale. No person shall offer milk for sale which is unwholesome, watered, or adulterated, "swill" milk, or milk from cows that are kept tied up in stalls, or fed upon garbage; neither shall any butter made from such milk be sold. The penalty for infringing these rules is a fine of from $5 to $100, or imprisonment up to ninety days; both may occasionally be inflicted at the discretion of the court.

The laws in GEORGIA, which are extracted from the Georgian Code (Edition of 1867), are, according to Consul Tasker-Smith, very severe, and run as follows:—

"1.—The inferior courts of the respective counties may appoint annually an Inspector of Flour. His duty is to examine all barrels, half-barrels, and bags of flour, and to determine the qualities of Fine, Superfine, Middling, First, or Second.

"2.—If any person shall pack flour in an old barrel which shall have the brand still upon it, a fine of $20 for each barrel so packed may be recovered before a Justice of the Peace.

"3.—If any person knowingly or carelessly sells unwholesome provisions of any kind, the defect being unknown to the purchaser, any damage resulting to him, his family or property, shall be made good by the seller.

"4.—Any baker, brewer, distiller, merchant, grocer, or other person selling unwholesome bread, drink, or pernicious liquors, knowing them to be so, shall be indicted, and on conviction shall be fined, imprisoned, or both. Accessories after the fact, except when otherwise provided, shall be punished by a fine not to exceed $1,000; imprisonment, not to exceed six months; whipping, up to thirty-nine lashes; to work in a chain gang on the public works for not more than twelve months. Any one or more of these penalties may be ordered at the discretion of the Judge.

"In addition to these laws, there are certain local ordinances in force in the City of Savannah, viz.:—

"5.—If any baker put into bread exposed for sale any but proper grain, or shall impair the purity of his flour more than is absolutely necessary to the making of the bread, he shall forfeit the batch, and be fined up to $50. The same penalty may be inflicted for refusal to allow a search, or for preventing the seizure of such bread.

"6.—All flour shall be inspected by properly appointed Inspectors for the city, whose duty it is to examine and brand all that is brought for sale or export. The penalty for interfering with the Inspector runs up to $20."

Mr. Tasker-Smith concludes his remarks by observing that, after all, the great safeguard against adulteration is the good character of the tradesmen who deal in these commodities; and that the laws, although very severe, are seldom required to be enforced.

Observations of the same nature are made by Mr. Consul Lynn, in his report on TEXAS, and particularly the town of Galveston. The penalty by the laws of Texas (Aug., 1856) is a fine varying from $25 to $500; but "it is seldom that people have been punished in this State for a violation of this Act. Fear of public censure appears to be more powerful in preventing fraud than the imposition of a fine, which must, for the most part, be disproportionate to the offence, or the profit derived from it."

In SAN FRANCISCO, according to Consul Booker, a new Board of Health has just been established by the Legislature; and amongst its enactments is one with regard to the adulteration of milk, which is identical with that of Cincinnati.

We will now change the *venue* for a time, and see what are the laws of some less known countries.

Consul Cowper informs us that, in the Island of PUERTO RICO, the laws relating to food are municipal and not legislative, and date from 1850. The *Corregidor* is the chief municipal authority in the island, and his position is rather that of a French Prefect than of the Lord Mayor; for, in addition to him, there exists in the capital an *Alcalde Mayor*, or chief magistrate, whose functions are local, and who, like the Alcaldes of the different districts, is subject to the Corregidor. This latter official is bound to appoint an annual Board to visit markets, shops, and slaughter-houses, and to examine the condition of food exposed for sale. Besides this, he appoints a monthly commission of *Regidors*, each of whom takes a different department—one, the live cattle; another, the dead meat; whilst others superintend the sale of milk, fish, groceries, etc. All the Regidors serve gratuitously. The owner of cattle must obtain from the municipality a certificate of their being healthy before being slaughtered, under pain of being fined $25. Bread of inferior quality is confiscated, and given to the poor; but if unwholesome it is thrown away, and a fine of $25 imposed. Bad fish is destroyed in

the same way, and milk is poured into the streets if mixed, even with water. The penalty in both cases is $25. The sale of watered milk and badly jointed meat appears to be the principal cause of complaint in Puerto Rico, and the laws are not very actively enforced.

In MADEIRA, according to Consul Hayward, the existing laws are comprised in the Portuguese Code of 1852, and a subsequent Decree of 1867. By the Code the following offences are punishable with imprisonment from one to twelve months, and a commensurate fine:—1. For deceiving purchasers as to the nature of the commodity sold. 2. For selling counterfeit goods or adulterating with any substance to increase weight or bulk, even though such substances are not prejudicial to health. The Decree ordains further that the sale of any adulterated goods is punishable with imprisonment for from two months to two years; and still greater punishment may be inflicted for aggravated cases. Adulteration, however, is not a very common offence in Madeira.

Mr. Consul Walker tells us that, in CAGLIARI, regulations were passed in 1869, and a pamphlet published, containing 218 articles respecting the sale of food and drink. Briefly extracting from these—it is first of all enacted that any person wishing to open a business for the sale of food, has to demand permission from the *Syndic*, or Mayor, and obtain a certificate, in which are distinctly stated the calling of the applicant and the position and number of his shop or stall. The non-fulfilment of this preliminary duty renders the defaulter liable to a penalty of 10 lire* for the first offence. It is distinctly prohibited to expose for sale eatables or drinkables which are stale, corrupt, or mixed with any injurious ingredients. If there is any mixture of innocuous substances, the seller must make known their character and quality to the purchaser, by a notice hung up conspicuously in his shop. Eatables or drinkables showing signs of decay, or any impurity, are immediately seized and destroyed. The fines enacted for the sale of obnoxious food run from 5 lire to 20 lire, in addition to which the licence is forfeited. These laws are tolerably well carried out, and a confiscation of bad or adulterated articles is occasionally made; moreover, if there appears at any time a want of energy on the part of the local police, in the enforcing of these regulations, the newspapers are sure to take it up. Indeed, these laws may be said to have a very beneficial effect; for without them, owing to the severe taxes that are levied by the Government on all articles of consumption, vendors would be apt to adulterate far more than they do, in order to gain a greater profit.

(TO BE CONTINUED.)

* A lire is equal to the French franc.

FOOD SUPPLIES IN PARIS, BEFORE INVESTMENT.

[This article was sent from Paris on the day *before* communications were cut off, and arrived too late for insertion in the last number of the Journal. At page 539 will be found a later account, received by Balloon Post whilst at press.—Ed.]

Whether Paris be actually besieged or not, it is already nearly beleaguered; no one can quit or enter it without a special pass; and under no circumstances are the gates opened betwen eight at night and daylight. A case occurred in which a corps of *Francs-tireurs* arrived at midnight at the fortifications, and had to remain outside till the morning; they had with them a caisson of ammunition, and hearing what they thought was cannonading, but which in fact was the blowing up of bridges on the Seine, they were just about to empty the ammunition into the river when they were admitted.

The preparations for the siege have taught us a lesson respecting the provisioning of a great town, and show how much civilised society does for its members in the material way. Every bit of pasturage, and nearly every morsel of waste land, besides the old and new cattle markets, and several temporary laystalls, are filled with cattle, sheep and pigs; and hundreds of warehouses, sheds, and other places are crammed with corn, hay, and straw; yet the two or three hundred thousand animals now within the walls, are only sufficient to supply meat for two or three months at most. There may be meat enough for a long siege, though that is doubtful, in spite of its being eked out by large quantities of preserved meats of all kinds, ham and bacon, Australian meats, pickled and dried fish, extract of meat, etc.; but should the siege continue for several weeks, milk, butter and eggs will very soon become unattainable. Quantities of preserved milk have been laid in, and a certain amount of salted, potted, and clarified butter, but probably in very insufficient proportion to the demand; an immense store of fruit has been preserved, and a good deal of marmalade, etc., imported.

Bread and wine are, however, the two staples of food in France. A healthy peasant scarce touches anything else but these, with potatoes and haricot beans, from one week's end to another; soup and bread form the universal diet of the army in times of peace, and of a large portion of the *ouvriers*. The peasants give a relish to their brown bread in a manner that perhaps would not attract an Englishman; they rub it well with a clove of garlic to make it tasty, and seem to enjoy it thoroughly.

The provision of wheat and flour is enormous: in the first place every baker is by law compelled to have three months' provision of flour in store; and lately they have filled every nook and corner with extra supplies; the great circular corn market is literally crammed to the roof, which is very high, and so is one of the divisions of the central market itself, to the very rafters. In addition to this the Government has a large reserve in the military stores, where wheat is kept and bread made for the entire army of Paris, and all the charitable establishments; vast warehouses have been converted into granaries in all parts of Paris, and the flour has poured into the city in such quantities, that no more space remains in any of the public buildings. In case of accident, and baking on a large scale becoming difficult, a great number of biscuits are being made; the government bakers are at work night and day; fancy bread and biscuit bakers, who generally produce nothing but the finest of the fine, have their windows filled with big square biscuits; and very large quantities are coming in from England, and, I believe, from other countries. It may be mentioned here that the whole, or nearly the whole, of the biscuit for the French army, in the Italian campaign, was contracted for, and supplied by, the well-known firm of Peek, Frean and Co., immense quantities of whose goods may be seen at all French ports.

If Paris should be cut off from communication with the country, we shall certainly be deprived of fresh vegetables and fruit, and shall learn how much comfort we owe to the peasants and market gardeners; and this deprivation cannot fail to have a bad effect on the general health. It will be all the more vexatious as the crops of grapes, peaches, apples and pears are magnificent, and the fruit fine and unusually cheap. We are doing our best to eat up the peaches, and they will soon be gone; but to lose our supply of grapes in September and October would be a great hardship.

The other day famine seemed to be coming upon us all at once; everybody who could do so laid in stocks of provisions; the shops of the grocers and provision dealers were almost emptied; gentlemen might be seen rushing home with the last ham or tongue from so-and-so's shop, for which they had paid four francs a pound; the tradesmen were compelled to decline sending anything home; and some articles, salt among the number, were not to be obtained at any price. Potatoes, too, were very scarce, and commanding fabulous sums. This, at last, created such an *émeute* at the central market that excessive prices will not be allowed to be asked there again, the Government having undertaken to fix the prices of meat and bread, as well, I believe, as of all articles sold at the markets.

The stock of wine in Paris is always equal to at least three months' consumption; it has now been more than doubled, and all the public docks and cellars being full, an immense quantity of casks have been placed along the quays of the river, and covered over with sand to preserve them from the weather. These notes will give some idea of the difficulty of providing less than two millions of people with provisions for a few weeks.

A few words relating to German army supplies will also be interesting. MM. Lachmann Frères, of Frankfort, have contracted to supply five corps d'armée, in all 210,000 men, and have purchased 7,000 heads of cattle, 9,500 quintals of bacon in Holland and Westphalia, 8,000 bags of rice at Rotterdam and Bremen, and 12,000 quintals of vegetables in Silesia. They roast daily 15,000 lbs. of coffee at Frankfort, Cologne, and Hanover. For the 65,000 horses in the Prussian army, 500,000 sacks of oats have been purchased of various contractors.

The following notice is not over agreeable:—"The *boucherie hyppophagique* formerly outside the walls of Paris, is now installed in the old abattoir of Belleville.

G. W. Yapp.

Preservation of Eggs.—The method of preserving eggs has attracted much attention of late in France, and as it is a very important matter in a culinary point of view, it will not be uninteresting to detail the result according to the best authorities. The old mode of packing the eggs in earthenware vessels, and covering them with lime water, or rather milk of lime—that is to say, a solution of quick-lime—is found, after a time, to alter not only the shell, but also the yolk and the white of the egg; and the *Pharmaceutical Journal* of Paris proposes the two following modes of avoiding that inconvenience:—1. Take 400 parts of water, 1 of cream of tartar, and 2 of slacked lime; stir the cream of tartar with the water till the salt is dissolved, and then add the lime. Let the solution subside, and cover the eggs with the clear liquid; after a short time the shells will be covered with small crystals, which is a sign that the preservation has been accomplished. 2. To 400 parts of water add 16 parts of lime, 3 of saltpetre and 16 of salt; boil the whole for twelve or fifteen minutes, and, when cold, pour it upon the eggs, placed with the small end downward in an earthenware vessel, lined with lead glaze, which is to be kept in a cellar. Another method in use is to spread a layer of finely powdered rock salt, as free as possible from magnesian salts, which are too hygrometric, and place the eggs in this so that they do not touch each other; then to fill in fine salt between and over them, and so pack the case with alternate layers of eggs and salt. The experiments of a large egg merchant at Lille have led him to the conclusion that smearing the eggs with linseed oil, or *huile d'œillette*, is the most simple method of all, and sufficiently protective. Other persons prefer beef fat for the same purpose. Eggs are also preserved in the form of powder, by drying their contents over a gentle fire, as in the conservation of vegetables. The powder must be kept in a dry place exposed to the air; and when wanted for use it is warmed in a little water.

MILK.

MILK consists of water holding, in solution, casein, sugar, and saline matter, or salts; and, in suspension, fat (butter) in the form of minute globules, probably enclosed in a skin of casein, which give the milk its white colour and opacity.

The fat, with a little casein, sugar, and salts, constitutes the cream, which separates on allowing the milk to stand at rest for some time, the greater part of the casein, sugar, and salts remaining in the milk. The composition of genuine milk varies with many circumstances. The following table shows the composition of genuine milk, as ascertained by myself and other chemists. Of the last three analyses the first is the best, the third the worst, and the second the average of twenty samples recently analysed in my laboratory.

Table showing the general composition of Milk.

Analysts.....	Henri and Chevalier.	Playfair.	Voelcker.			Davies.		
			1	2	3	1	2	3
Casein	4·48	4·0	3·30	3·47	2·81	4·26	4·09	3·76
Fat.....	3·13	4·6	7·62	3·99	1·79	6·26	5·16	3·32
Sugar.....	4·77	3·8	4·46	5·11	4·04	5·13	4·27	4·00
Salts	0·60	0·6	0·71	0·78	0·66	0·60	0·66	0·81
Water	87·02	87·0	83·91	86·65	90·70	83·75	85·82	88·11
	100·00	100·0	100·00	100·00	100·00	100·00	100·00	100·00

In examining milk, its specific gravity, the specific gravity of its serum, and the proportion of cream which it yields ought also to be ascertained.

The proportion of cream varies greatly: in ten samples of genuine milk which I tested, it ranged from 10½ to 17½ per cent. (by volume). The specific gravity of the milk, that is, its weight, as compared with the weight of an equal volume of water, should always be ascertained; although we cannot, as is frequently supposed, draw from this any very definite conclusions as to the quality of the milk. Fat being lighter than water, an increase in this, which of course increases the richness of the milk, causes a decrease in its specific gravity; and, therefore, if we depended on this alone as a test of the genuineness of milk, we might be led to declare a sample mixed with water, when in truth it was not only quite genuine, but unusually rich; and, on the other hand, a sample from which a part

of the cream had been withdrawn would have its specific gravity increased, and might be pronounced of very good quality.

The age of the cow, the food on which it is fed, and even the temperature of the atmosphere influence the quality of the milk. Cows fed upon beet-root yield milk containing less casein and less fat, but considerably more sugar than that of animals fed on hay or grass; whilst carrots appear to increase the quantity of sugar, without making any appreciable difference in the casein and fat. Experiments on this subject are, however, as yet too few and too imperfect to allow us to draw accurate conclusions. It has been stated that in a hot and dry country the yield of milk is less, but its quality richer; also that cold weather is favourable to the production of casein and sugar, whilst hot weather increases the proportion of butter. All these statements, however, require to be confirmed by further and more carefully conducted experiments, before they can be fully relied on.

In analysing a sample of milk, we should ascertain the amount of solid matter, of casein, fat, sugar, saline matter (or salts), water, the proportion of cream as indicated by the lactometer, the specific gravity of the milk, and of the serum (or liquid portion) of the milk from which the casein and fat have been removed by coagulating and straining. The accurate determination of these points is far from being a simple matter.

The quantity of cream in any sample of milk may be ascertained by means of an instrument called a lactometer; this instrument varies slightly in form. Those which I employed were like test tubes, about 12 in. long and ¾ in. diameter; about 2 in. from the top a line was drawn completely round the tube, and the space between this line and the bottom graduated into 100 parts. When a sample of milk was to be tested, one of these tubes was carefully filled exactly to the top line, and allowed to stand at perfect rest for twenty hours; during this time the cream rises to the top, and the amount may be easily read off, each division of the lactometer scale representing of course 1 per cent. (by volume) of cream.

The specific gravity of milk in its fresh condition, as already stated, affords no indication of its purity or otherwise. It appears, however, that the serum has a more constant specific gravity; and, by accurately observing this, a tolerably correct idea may be obtained as to whether or not the milk has been diluted with water, and even what quantity of water has been added.

The specific gravity of the milk itself, and of the serum, may be taken with the hydrometer, or more accurately with the specific gravity bottle. In my experiments I always employed the latter.

Ten samples of milk of known purity gave the following results:—

	1	2	3	4	5	6	7	8	9	10
Specific gravity of Milk ...	1030·4	1031·0	1030·8	1027·8	1024·6	1024·6	1029·0	1031·2	1027·6	1027·0
" " Serum ..	1027·0	1027·6	1028·0	1027·8	1027·6	1027·8	1026·0	1027·0	1026·5	1025·9
Cream per cent.	11·0	10·5	11·5	13·0	17·0	17·5	14·0	12·0	14·0	14·5

These experiments having been made, portions of the milk were mixed with different quantities of water, and the same experiment repeated with the diluted samples, except that the amount of cream was not ascertained.

Milk mixed with 50 per cent. of water gave the following results:—

	1	2	3	4	5	6	7	8	9	10
Specific gravity of Milk ...	1015·0	1015·7	1016·0	1013·4	1011·2	1012·0	1014·0	1013·2	1013·0	1012·5
" " Serum ..	1015·0	1015·4	1015·6	1014·6	1014·6	1014·2	1015·0	1015·0	1014·0	1014·3

Milk diluted with 40 per cent. of water gave—

	1	2	3	4	5	6	7	8	9	10
Specific gravity of Milk ...	1021·0	1020·5	1020·0	1019·0	1016·0	1017·0	1020·4	1021·0	1019·0	1019·4
" " Serum ..	1021·0	1021·0	1020·0	1020·6	1020·0	1020·6	1021·0	1021·0	1020·8	1020·4

Milk mixed with 20 per cent. of water gave—

	1	2	3	4	5	6	7	8	9	10
Specific gravity of Milk ...	1024·0	1024·5	1024·0	1022·6	1019·0	1019·2	1020·2	1021·0	1022·0	1019·9
" " Serum ..	1024·0	1024·5	1024·4	1023·6	1024·0	1023·8	1023·0	1024·0	1024·0	1023·2

From these results we get the following average specific gravity:—

	Pure Milk.	Milk with 50 per cent. water.	Milk with 40 per cent. water.	Milk with 20 per cent. water.
Average specific gravity of Milk	1028·4	1013·6	1019·3	1021·6
" " " Serum	1027·1	1014·7	1020·6	1023·8

From my own analyses, and from those of other chemists, I conclude—

That genuine milk should have a specific gravity ranging from about 1024·5 to 1031·; but that this cannot be depended on as a test of the purity or otherwise of milk;

That the specific gravity of the serum of genuine milk should be from 1026· to 1028·; and if much below 1026·, it is a pretty certain indication that water has been added;

That the amount of solid matter in genuine milk should be from 10 to 15 per cent;

That the amount of saline matter, or ash, should never reach 1 per cent;

That the amount of cream varies greatly, ranging in the samples examined by me from 10½ to 17½ per cent.; the average being 13·4.;

That the specific gravity of milk diluted with 50 per cent. of water is from 1011° to 1016°, and of the serum from 1014° to 1015·6;

That the specific gravity of milk diluted with 40 per cent. of water is from 1016° to 1021°, and of the serum from 1020° to 1021°;

That the specific gravity of milk diluted with 20 per cent. of water is from 1019° to 1024·5, and of the serum from 1023° to 1024·5.

The above remarks of course refer only to the admixture of water with the milk, and this in reality appears to be the only substance used for that purpose. At least I have myself never met with any of the substances sometimes enumerated as employed for thickening diluted milk, such as chalk, sheep's brain, mucilage, sugar, etc. The only abnormal solid matters I have ever known added to milk have been small quantities of carbonate of soda, and nitrate of potash, the former of which is used to prevent milk turning sour, and the latter to remove from the milk the peculiar taste imparted to it by certain kinds of food given to the cows. Both these salts are perfectly harmless, even though added in very much larger quantity than they are ever likely to be.

We have now to compare milk as ordinarily sold at town dairies with genuine milk, the composition and properties of which I have just described. For this purpose fifteen samples were purchased at different dairies in Manchester, and each sample submitted to a careful general examination; a determination being made of the specific gravity of the milk and serum, the percentage of cream as indicated by the lactometer, of solid matter, and of salts. In addition to the chemical tests, each sample of milk was examined by the microscope. The microscopical examination in no instance revealed the presence of any abnormal constituent. The results of the chemical examination are given in the following table:—

Table showing the specific gravity and general composition of Milk as sold in Manchester.

Sample	SPECIFIC GRAVITY		PER-CENTAGE OF			
	of Milk.	of Serum.	Cream.	Solid mat.	Ash.	Water.
1	1024·6	1023·0	5·5	11·42	1·27	87·58
2	1023·0	1022·0	6·0	9·21	0·65	90·79
3	1024·4	1023·6	7·0	10·05	0·72	89·95
4	1026·0	1024·0	6·5	9·56	1·10	90·44
5	1019·3	1021·5	8·0	9·00	0·80	91·00
6	1023·1	1022·0	5·0	8·21	0·56	91·79
7	1028·2	1025·6	8·5	9·06	1·09	90·94
8	1024·6	1021·0	4·5	8·30	0·91	91·70
9	1030·0	1027·5	11·0	16·04	0·77	83·96
10	1019·0	1022·6	9·0	7·02	0·60	92·98
11	1027·0	1026·0	8·5	12·57	0·68	87·43
12	1025·0	1022·0	7·5	10·00	0·80	90·00
13	1026·5	1023·0	6·0	10·17	0·79	89·83
14	1024·5	1025·0	8·0	11·25	0·92	88·75
15	1025·0	1026·0	9·0	12·05	0·78	87·95

Looking at this table we find that, out of the fifteen samples examined, only two had a specific gravity below the minimum of the

genuine milk, but that the specific gravity of the serum was in twelve cases below that of genuine serum, and only in three samples, Nos. 9, 11, 15, does it reach or exceed this minimum.

Of the twelve samples the specific gravity of whose serum is below the standard of purity, one, No. 8, corresponds to the serum of milk diluted with 40 per cent. of water.

Six samples, Nos. 2, 3, 5, 6, 10, 12, yield a serum whose specific gravity is above that of milk with 40 per cent. of added water, but below that of milk with 20 per cent. added water, and which therefore contains more than 20 but less than 40 per cent. of water.

The serum of three samples, Nos. 6, 4, 13; has a specific gravity such as would be produced by the addition of about 20 per cent. of water.

That of two samples, Nos. 7 and 14, has a specific gravity slightly below that of pure serum; but in these cases the difference is so slight that these samples may safely be considered as undiluted.

Of the fifteen samples of Manchester milk examined, I conclude that three only are perfectly genuine, and free from admixture with water; two others, though slightly below the standard of purity which I have adopted, yet cannot be said to have been diluted with water; one contains about 40 per cent. of added water; six contain upwards of 20 per cent. of added water; three contain about 20 per cent. of added water.

Besides thus diluting milk, it is a very common practice to remove a considerable portion of the cream; in many samples sold as new milk, I have found that from one-fifth to one-third of the cream has been removed, and after this a certain proportion of water added; but I must defer entering into this part of the subject till some future time.

ARTHUR E. DAVIES.

[We purpose shortly to deal with the question of preserved and desiccated milks.—ED.]

WHILST agriculture is suffering on the Continent in consequence of the war, we are undergoing no small loss from causes which are within our own control, if we only choose to exert ourselves a little more. We are *losing food*, and the farmers are therefore losing the *value* of that food, in consequence of the foot-and-mouth disease and pleuro-pneumonia, to an extent which would be equal to a rise of 10*s*. on a low estimate, or 14*s*. on a high one, on *every quarter of wheat* that we shall require to import between this and next harvest; to say nothing of the deterioration of the quality of a very large quantity of the meat which is not actually condemned as diseased, the value of which it is not easy to estimate, even approximately, but which we should be much more likely to put at too low rather than too high a figure.—*Wilts and Gloucestershire Standard.*

THE HISTORY OF ENGLISH FOOD ECONOMY.

Our friends, the Germans, or High Dutch, have a gift beyond us in writing books; and, above all, those of history. They know where to begin, but seldom know where to leave off; and, if they can, they begin beyond the beginning. They frequently tell us, not only what Adam did not, or could not do; but even what the Pre-Adamites, according to the Rabbins, may have done or not done.

Now, I hold it good to begin the history of the economy of food in England, by showing that we started without any economy of food at all, and have gone on in that way with very little thought of it. Our forefathers, the old English, made a clean sweep of everything in this island; and all Roman farms and settlements which the Welsh had spared, they ruined. Hence they started anew as a community of herdsmen, a state suited to the wars in which they so long lived with the Welsh; for while growing crops could not be carted away, and might be burnt, the flocks and herds could be driven into the fastnesses of the woods and marshes; and while corn had to be carried in waggons, the oxen, sheep, and swine walked.

There was no want of waste lands in each township at that time, but a want of men to till them. Perhaps the first true help given to husbandry was the building of the great Benedictine monasteries. These were large socialist settlements, where the men worked for their livelihood, and which, wit being brought in as well as capital and labour, became great schools for all learning; so that husbandry and gardening flourished in model farms and model gardens.

From them the growing English learned husbandry, notwithstanding the wars with their brethren, the Norsemen. After the Norman pretenders were seated on the throne of Edward the Confessor, their love of forests gave rise to disputes, for they threw several settled townships into the New Forest; and, out of hatred to the Normans, the English treated this, which they had themselves done over and over again, as the wasting of so much corn and food land; still it is a great step to get anything to be discussed which beforehand has been unthought of and neglected. It is likewise true that our fathers, in their thorough hatred of the Normans, held that the very soil and climate of England had been fouled by them; as it was steadfastly believed that, before the coming of the Normans, the ground of Norfolk was so rich it could be ploughed with a case knife and a rabbit.

The constant droughts and famines, which fell so sorely every three or four years, perhaps struck the minds of our fathers less, as they were held to be rightful visitations of God, for offences against our Holy Father the Pope, his Church, or some saintly bishop, or for the nonpayment of Peter's pence or tithes; but what did strike them more clearly was the question of tillage and pasture, which grew up after the coming of the Flemings. The English trade in wool became so great that sheep were foremost in the husbandmen's eyes. It is probable that some tilled land was thrown into meadow,—it is more likely that the growth of tillage was only stayed. Still, there arose a wholesome fear as to the supply of food, and the several claims of wool and corn. Debated by the people, this question passed into the newly-formed parliaments; and, although no right views of political economy had the mastery, yet there was an earnestness awakened as to the food wants of the people; and this was the true framework of many efforts to bring more ground under tillage. It was no longer thought a matter of course that land should lie waste as it had done for hundreds of years, for it was grudged for sheepwalks; and, therefore, what the sheepfeeder could not utilise was taken in hand for husbandry. A growing population helped this movement.

The suppression of the monasteries threatened the same dangers to husbandry as to some other branches of knowledge cultivated in their great schools; but, luckily, counterbalancing causes were at work. Printing helped us as much as anything. Books were published on husbandry; and the groundwork was laid of the study of political economy by many writings of Raleigh and others on fisheries, timber, wool growing, mining, and the means of helping forward our trade at home and abroad. The Reformation, the discovery of America, and the pouring forth of gold and silver from the new world, gave a wonderful start to this country, as to all others; and thus our husbandry was pushed forward.

By the time that Elizabeth came to the throne, to feed the people had become an acknowledged public care; the Queen, the Parliament, and the people could be appealed to; and if the highest wisdom did not prevail in the earliest discussions and measures, yet there was a great awakening. Many new trees and plants were brought from abroad, and among these the potato may be specially named.

From that period the study of political economy and the practice of its teachings went forward, as well under the Stuart kings as under the Commonwealth. The history of political economy in the seventeenth century is the chronicle of many plans for increasing

the national wealth. During this century the dying out of the custom of keeping fish-eating fast days made the English consume more meat, while they also became greater eaters of corn. Not only was salt fish replaced by fresh meat, but also salt meat. The stock being better fed in the winter, there was no longer the need for killing off in the autumn, and salting down for the winter. Now salt meat and salt fish are wasteful where they are used instead of fresh; and are only economical when they are additions, by importation, to the food of the country. At the same time the health of the people was improved by the wider growth of vegetables, and most of all in winter time.

The steady growth of England throughout the seventeenth century brought us so forward that, in the beginning of the last century, we had become shippers of grain to Europe. This is one of the most noteworthy points in these annals; for it shows that there was a regular improvement at a time when the condition of the working classes was favourable. Afterwards the export of grain lessened, but this was because the population was growing beyond the area of corn land, and faster than the power of the farmers to increase their crops. We next come, in the middle of the last century, to a time when all were thoroughly alive to the importance of increasing our home resources. Then there arose a great demand for agricultural improvement. The wealth and enterprise of our merchants and manufacturers were conspicuous, when they displaced the owners of mortgaged lands, and converted their mortgages into freeholds. At the same time old and wealthy landowners rivalled the new comers. The breeds of stock under the auspices of the Bakewell experiments were well cared for; turnips and root crops were extended because sheep and cows were of higher value; drill husbandry raised heavier crops of grain, and saved seed; and mechanical ingenuity was brought to bear to improve ploughs and other implements.

During this era of activity the cottier population was driven out of its holdings, although the available breadth of land was increased; because the enclosure of commons, by Act of Parliament, was yearly extended. The cottier, however, could not contend with the rivalry of capital; and in one sense his removal was a benefit, because it left a freer field for the operations of the capitalist; so that the heavy lands and the light lands were equally brought to a higher state of production. The moral consequences of depriving us of that large agricultural body, so well represented in our northern counties and the United States, is a separate question altogether. In England, the cottier population had not developed agricultural

improvement, because it had not that scope for spade husbandry which was afforded to the Flemings by their wide plains of deep soil, to which the manure of the manufacturing towns was conveyed by rivers and dykes. An English cottier, on clay land, in hilly ground, and away from large towns, has not the same chance as the Fleming. It by no means follows, however, but that spade husbandry, or retail culture, may not receive a greater extension in England by means of cheap railways, and a proper application of town sewage. Then, too, the lending of steam ploughs, reaping and threshing machines, may enable the small capitalist among farmers to do what small capitalists do in all other trades, namely, set up small workshops, wherever brains and labour have a fair chance of bringing about profitable results.

The weeding out of the cottier population became coincident at a later time with other influences, unfavourably affecting the working classes, and above all, those working on the land. The great revolutionary war was a heavy blow to us. For almost the first time, we had had free trade with France, and had reached as great an amount of commerce with that country as we had before the revocation of the edict of Nantes. We not only lost it, but the greater part of western Europe was wasted by grievous wars, ruinous to trade and manufactures. The great market of Holland, a money market and a depôt for grain and for manufactures, was brought to ruin. Our ill-starred quarrel with our brethren in the United States had cut off that field for investment and emigration. Englishmen no longer set up as tobacco planters and rice growers in the south, nor did their farmers' sons and handicraftsmen look out for homes in the north. Even our convict labour was rendered unproductive. Great famines accompanied the war, and made themselves sorely felt here, as well as elsewhere in Europe.

The demand for men for the war by sea and by land was not perhaps such a heavy drain upon a great and growing population as is believed; but still it worked as one means of oppressing the labouring classes. The Poor Law, which ensured bread for all the suffering people, became the severest instrument for their enslavement. The wife, the children, the mother, and the sister, of the sailor or the soldier, not being left to starve, were fed, not by the honourable bounty of the nation, but as paupers, by parish relief; and the agricultural labourers and their children were all made paupers, and served with a dole of parish bread by "scale," according to the number of mouths.

HYDE CLARKE.

[TO BE CONTINUED.]

UNWHOLESOME FOOD IN MANCHESTER.

THE CITY OF MANCHESTER, like all populous manufacturing towns, is sorely plagued by a set of unprincipled persons, known throughout the north-western district as "slink" butchers. These men deal not only in the leanest and most innutritious meat which they can get, but are continually on the look-out for animals whose death is fast approaching from disease, and carcasses from which life has departed without bloodshed. The slang term for a carcass of this kind is "chance;" and bad indeed must a chance of this sort be, if the slink butcher does not avail himself of it. Some of these gentry keep men, whose special duty it is to go round the country for many miles, calling at the dairy farms, which are more numerous in the manufacturing districts than elsewhere, to see if there are any "yellow-feet" (newly dropt calves), "queer uns" (diseased cows), or "chances" of any kind on hand; in which case a bargain is at once struck, the sellér wishing the buyer luck as he strikes the latter's open right hand to seal the bargain; and, ere many days have elapsed, if the wished-for luck attends the transaction—the greatest obstacle to its consummation being the meat inspector of the town to which it is taken—this "chance" has passed through the interiors of some scores of the lowest class of toilers, and most probably implanted the seeds of death in the system of more than one of them, to say nothing of those who have merely been prevented following their employment by the diarrhœa and sickness which this poisonous food has brought about.

What a deplorable business this appears, when we contemplate it in all its bearings! It brings profit to none but the slink butcher himself. Certainly the farmer's loss is slightly lessened by selling the carcass for consumption, but only slightly, for the purchaser pays but a trifle over the knacker's price; and if, *by chance*, the farmer gets anything by these transactions, the loss or punishment levels the fruits of many tradings with the slink butcher. The farmers who systematically sell their diseased and dead animals are seldom successfully prosecuted for it; most of them know how to evade the law, by preventing the carcass being dressed for food upon their premises. It must be taken away as it dropt,—that is a condition of the bargain. There is no law to prevent a person selling a dead

animal to the knacker, whatever condition it may be in, or to anyone else who pretends that it is for the knacker; so the farmer pockets the money, wishes the slink butcher luck, and spreads disease and death amongst the town poor in security.

If there is honour among thieves, there is not much of it amongst slink butchers, for a great portion of their ill-luck emanates from their own set. Occasionally two or more will meet at a farmhouse, bent upon the same errand. If they can agree amongst themselves that one has as much right there as the other,—that neither one nor the other is the regular and acknowledged customer of the place,—then the affair is settled amicably by a "stand in," which means that the purchaser shall pay the other, or others, a certain sum not to bid against him; but if one should set up a claim to exclusive dealing with the farmer which the others will not allow, then competition takes place, and the affair not unfrequently ends in a "crab." The unsuccessful bidder keeps quiet until the purchaser of the "chance" gets it home and has dressed it for sale, and then "rounds on it," which means that he lets the inspector know where he may pounce upon it. If, however, the wished-for luck attend the "chance" until it has been turned into money by the retailer, we may imagine the misery to the consumer, and the expense which it entails upon the country! Those who partake of it are soon incapacitated for labour; and as they are never many days removed from pauperism, they come upon the poor rates; and an out-door pauper's funeral frequently deprives a slink butcher of a customer.

Purchasers of slink meat buy most largely on Saturday nights, and generally by gaslight; but, if they are not good judges of meat by its appearance, they surely should have intelligence enough to be ruled by its price per pound. The truth is, that very many of them will save a sixpence upon the purchase of their meat, and spend it the next minute upon a quart of beer or a noggin of spirits. If they would give a penny or two more per pound for their meat, and purchase it at respectable shops, taking a lesser quantity if necessary, they would get rough-cuts of good, wholesome, and nutritious food, in place of the health-destroying and poisonous carrion which the great majority of them now persist in consuming.

If the people purchase this stuff in its undisguised state, the reader will have no difficulty in believing that they show no reluctance to indulge in such dainties as "veal pies," "sausages," "brawn," and "saveloys," which can be bought even cheaper than the diseased meat itself. The only wholesome ingredients in these things—let it be understood that I am speaking of the cheap ones only—are the pepper and salt, of which they are not stinted;

indeed, the other ingredients would be too nauseous to swallow without this high seasoning.

The city of Manchester has for some considerable time had an unenviable notoriety for its high death-rate, and many theories have been put forward to account for it,—amongst the rest, the consumption of unwholesome food; but, inasmuch as nearly all other manufacturing towns similarly situated are quite as much subjected to the same infliction, we must look in some other direction for the cause of the excess; resting assured, however, that unwholesome food here, as elsewhere, will do its full share of the work.

That the officers of the Corporation of Manchester are, at least, doing something to check this nefarious traffic, we may be assured, from the return of unwholesome food seized and destroyed in that city from January 1st to August 31st, 1870, which is as follows:—

Beef	6,885 lbs.
Veal	1,597 ,,
Pork	424 ,,
Bacon	57 ,,
Ham	13 ,,
Total Meat	8,976 ,,
Herrings	74,796 ,,
Mackerel	5,101 ,,
Soles	525 ,,
Cod	308 ,,
Haddock	200 ,,
Whitings	60 ,,
Plaice	29 ,,
Salmon	26 ,,
Fresh Water Fish	310 ,,
Total Fish	81,355 ,,

32 Geese.	39 Rabbits.	398 quarts Shrimps.
6 Chickens.	38 bags Mussels.	500 lbs. Fruit.
363 Pigeons.	1 barrel Crabs.	6½ dozen Cauliflowers.

Of the 8,906 lbs. of beef, veal and pork, every ounce was diseased; the ham and bacon were putrid through failure in curing, and should never have been offered for sale as food. The immense waste of food as represented by the 74,796 lbs. of herrings, and 5,101 lbs. of mackerel seized, might have been prevented if the fishermen, and the dealers who purchase the fish upon its coming ashore, had taken the proper precautions. In the case of herrings no boat should put to sea in hot weather without a store of salt, as a small quantity sprinkled amongst the fish soon after they are caught would serve to keep them in good condition until consumed as "fresh" herrings, or sold to the packers; who would re-salt them, if neces-

sary, before sending them away. But herrings are much better for eating, if in good condition, without a grain of salt upon them, and would fetch a much better price in the market; and therefore the herring catchers prefer to run the risk in weather which makes failure almost certain, to incurring the slight expense and trouble which would bring them certain profit. Indeed the herring fishers of Yarmouth and Lowestoft take the precaution to salt their fish at sea when the temperature tells them that it is prudent to do so, and they consequently suffer very few losses. All their best fish are sold for the home market; the rest—some hundreds of thousands of barrels—are cured and sent to the Mediterranean ports. It is from Arklow and Howth, and the Isle of Man, however, that the teeming population of the north and north-western manufacturing towns derive their supply of herrings, and at none of these places do they salt the fish at sea. The consequence is that decomposition frequently sets in before the fish get into the hands of the water-side buyers, and although salt is then very plentifully used in packing them for their ultimate destination, they come to hand in a more or less putrid condition, and, if not seized by the authorities, work as deadly evil as the diseased meat.

Of mackerel there has been a wonderfully large supply this year, chiefly from Ireland. During one week they were sold—fine large fish—at *1s.* 8*d.* per score! But, as in the case of herrings, thousands have been destroyed, and thousands have been consumed which should have been destroyed, simply through the neglect of the persons who supply the market with them. The Norwegians send large quantities of mackerel to this country, and they always arrive in good condition. *They are packed in and covered with ice*, whereas the Irish senders use no ice; and the Norway fish are in better condition at the end of two weeks than the Irish at the end of two days.

Salt is cheap enough, and although ice is not so plentiful in Ireland as in Norway, the fishermen would find their account in following the example set them by their bretheren of the net at Yarmouth and Lowestoft, and the mackerel packers, that of the Norwegians.

J. P.

RUSSIAN BREAD.—Mr. A. Murray in his "Report on the Food Products of St. Petersburg," states that the breads resolve themselves practically into different modifications of their chief kinds; viz., *Tschernoi-chleb*, black bread made of rye; *Kalatsch*, white bread made from wheat—the best kind of which comes from Moscow; and *Saika*, or white bread enriched with raisins or other accessories, equivalent to our buns or the Scotch "cookies." These different sorts keep fairly well for a considerable time, and when they decay do not become offensive.

DAMP DWELLINGS.

THERE can be little doubt that damp is the most formidable enemy to health which our English climate harbours. We are not far enough north for piercing cold to be habitually or seriously dangerous. We are not far enough south to be subject to the fevers, malaria, and sunstroke of hotter climates. But the list of ills arising from the moisture of our climate is a long one; it embraces the most destructive forms of phthisis and rheumatism, and includes some ailments, such as coughs and colds, from which it is no exaggeration to say that not one in a thousand is exempt.

Our dress and our dwellings, our food and our habits of life, ought to be specially designed to protect us against inclement weather and its consequences; and no doubt to some extent they are so, but not in anything like an adequate degree; and it is notorious that our houses especially stand in need of improvement in this respect. This might easily take place if public attention were sufficiently directed to the necessity for it, and a dry house became an object of constant demand; but so long as the persons who take houses will rest quite content with their being roomy, well arranged, and pleasant looking, without much thought as to whether they are likely to prove dry and healthy,—so long will the majority of builders continue to neglect precautions which cannot be observed without some expense, and attention to which does not, they find, add to the money value of the houses that they erect. The first step to improvement in the average English dwelling-house is to create, if possible, a state of public opinion such as would render a badly constructed house an unmarketable article.

Damp, when it enters a house, comes in at the roof, at the doors and windows, through the walls, from the ground, or through leakage of pipes. The entrance of damp through the roof itself is fortunately so unpleasantly conspicuous, owing to its staining the ceilings, that it is not long in being found out, and before repairs more or less complete are made. But for this, roofs would be more commonly untrustworthy than they are, and injury to health and life would oftener occur through their failure. Many roofs are, however, so constructed that, in times of great rain and of snow, an inundation is almost inevitable; and the situation of such houses as are near trees exposes them every autumn to the danger of overflows from gutters stopped up with dead leaves. Roofs, to remain dry, should be of sufficiently steep pitch for the nature of their covering; flat

tiles requiring a steeper roof than "pan tiles," and these latter a steeper roof than slates. Whatever the covering, the materials should be good and well secured. Roofs should be so arranged as to dispense, as far as possible, with gutters and flats occurring in the middle of the building, but should, if practicable, throw off the whole of their water to the sides. The points where they join walls, parapets, and chimneys, are especially vulnerable, and should be especially protected, either by a lead "flashing," or by a cement fillet with a small projection formed to overhang it in the brickwork. It is essential that tiles or slates should overlap one another sufficiently, and that, if the covering is of metal (as lead, zinc, or copper), it should be so laid as to be free to expand or contract with change of temperature; and in exposed situations it is essential for tiles, and desirable for slates, to be bedded in mortar. This, however, must be so done as not to prevent there being a clear drip from one tile or slate on to another; otherwise the mortar will become saturated, and will conduct the water to the inside of the roof.

Where a roof is found to be defective, the fault is commonly due to broken or ill-secured slates or tiles, to defective covering to the joints next the walls, or to badly arranged gutters. In some cases it may be necessary to re-arrange the construction of the roofing, with a view to throw off the water more completely; but in the majority of instances the remedy is to replace bad materials and workmanship with better ones. Where it is admissible, a simply arranged and well constructed thatched roof is dry as well as warm.

For the same reason which makes the defects in a roof comparatively harmless, from our present point of view, defects in doors and windows, though certainly injurious, are not the worst of faults; for leaky windows, like an unsound roof, occasion discomfort when it rains, and they are therefore likely to be found out and remedied. Our sash window, the ordinary kind in use in England, is well contrived for keeping out rain; when well made of seasoned materials, a sash window is, without doubt, a perfectly weather-tight contrivance; and even when badly made it is superior to a bad casement. Where casements are employed, the most weather-tight construction is that which is universal in France although rarely seen in England. In this arrangement the window is divided into two folding casements, or glass doors, meeting in the centre, and both opened or closed at the same time; the joint being made tight by the edge of one casement being rounded, and the corresponding edge of the companion one hollowed. There is, however, a preference in England, when casements are used, for their closing against a frame; and here a

clever arrangement of hollows and projections will effect a good deal in the way of hindering the passage of moisture. A projecting fillet of wood, so arranged as to throw off the water which in wet weather drains down the face of doors and windows, is an excellent precaution against the entrance of moisture; and, where a somewhat expensive expedient can be adopted, the mechanical contrivance called a "water bar" is often successful in keeping out the weather at external doors and casement windows. For the ordinary leaky joints which constantly have to be encountered in some rough and ready way, there is no packing better than a piece of india-rubber tubing, nailed up against the edge of the defective joint. The enemy, however, attacks us openly when it comes in at the window or the roof; and the shape in which it shows itself—that of a stain or a pool of water—is a palpable guide to the locality where the defect is, and often furnishes a clue to the mode of applying a remedy.

Where moisture penetrates the walls, the case is widely different. The harm done is insidious; it may go on long without being detected; and when perceived it may be difficult to find out how the mischief arises, and almost an impossibility for even an experienced person to devise a remedy. It must be recollected that nearly all the materials used in building are porous, and consequently absorbent of moisture; many of them are pervious to wet to an extent little suspected, and in not a few instances they are even hygrometric. A driving wind and rain, in an exposed situation, will blow through many kinds of stone walls, and certainly through any sort of brick wall, if of moderate thickness and solid build; and a wall built with sea sand contains in its very mortar joints a material which has a constant tendency to absorb moisture. Further, many a wall which can withstand the ordinary attacks of rain falling against it, will give way before a stream of water poured down upon it at a given point; and it constantly happens that the arrangement of our houses is such as to give opportunities for this to occur somewhere or other. Lastly, bad workmanship, or unskilled use of materials, will make defective walls out of even good bricks and sound stone.

It is then of the first importance, if a house is to be dry, to know how far the materials with which we propose to build will turn water, and if we find we cannot rely upon them to do this, to understand how to remedy their defects; for the same bricks or stones which, built up in one way, will form but a damp wall, may often be made, by other modes of handling, to resist weather thoroughly.

T. Roger Smith.

SOME FAMILIAR TROPICAL FRUITS.

Not the least marvellous of the minor results accomplished by steam navigation may be witnessed any day in the streets of London. The quantity and variety of cheap tropical fruits offered for sale east of Temple Bar by our hardworking costermongers—fruits which, probably only six or seven weeks previously, were nodding and ripening under their native sunny skies, thousands of miles away—must have struck the critical observer with equal pleasure and astonishment. In the eyes of the Indian merchant emerging from Lombard Street, where he has been to pocket fat dividends, or to pay unwelcome calls, the fragrant whiff from the truck loaded with pine-apples and other gorgeous fruits may have no interest; yet the aroma must surely remind him of that glorious morning when he first landed at surf-defended Havannah, or obtained his earliest glimpse of the cliffs of Singapore. But the city clerk, just released from his daily toil, has no such associations; and he only sees before him, piled on the coster's barrow, a wealth of delicious and strangely shaped fruits.

With the view of familiarising those of our readers who have had no opportunity of seeing and appreciating such generous vegetable productions in the countries to which they are indigenous, and otherwise supplying a little useful and interesting information, the following remarks are offered:—

It is no doubt a matter of astonishment to many where the hawkers obtain these fruits so regularly in season, and in such a comparatively good state of preservation. The cheapness, too, may be another reason for surprise. From several sources the intelligent inquirer may glean information. He may peep into the hold of a West India steamer, on its arrival, about the beginning of April, during May, and part of June; there he will see thousands of African pine-apples, carefully packed, "heads and thraws," as our Scotch friends would say; the beams of the ship being festooned with clusters of plantains and bananas from the West. A few weeks later a superior pine-apple arrives from the West Indies, accompanied by better plantains and larger bananas, in time to fill up the gap before our own unrivalled strawberries so monopolise the market that tropical products would unheeded "spend their sweetness in the desert air."

During the season, which lasts pretty well from April to August, these fruits are sold by public auction on Mondays, Wednesdays, and Fridays, mostly by Messrs. Keeling and Hunt, the well-known

brokers n Monument Yard. Thither flock equally the greengrocer of high degree and the lowly costermonger — the purveyor for Royalty or Aldermanic feast, and the caterer for the million.

The prices obtained at these sales for home-grown pine-apples vary from 9*s.* to 12*s.* per lb., and for African and West Indian from 3*d.* to 3*s.* 6*d.* Costermongers are equally welcome at the sales with the largest dealers, as they invariably pay cash before delivery. The costers, especially those who have acquired the delicate art of producing wonderfully attenuated slices, make large profits; but, as undesiccated fruits pay no duty, it is almost hopeless to arrive at a correct estimate of the quantity annually sold; so we will proceed to enquire into their natural history, and note any circumstances not generally known.

The *Ananassa sativa* is essentially a tropical plant. It is found wild in America, and in the East and West Indies, yielding the well known succulent and delicious pine-apple. Without exception, it is the most luscious fruit grown in England, and its artistic outlines, added to its gorgeous hues, have from an early period rendered it a favourite with the horticulturist, and the artist engaged in designs for drapery—more especially those connected with the Paisley shawl manufacture. Excepting the Burmese pines, and probably the fruit reared at Singapore, which rarely reach our market, the most notable specimens are the produce of this country. But hitherto our native pine, on account of its high price, has only been attainable by the wealthy, so that it is quite a common sight on board a Peninsular and Oriental steamer to observe the young traveller, proceeding to China for the first time, who may have landed at Singapore for a few hours, returning loaded with pine-apples intended for his own private consumption. The griffin—as he is called by those who have probably succumbed to the very same temptation on a former voyage—innocently decorates his cabin with the ripe fruit, in the mistaken hope that his pines will last until he reaches Shanghai.

The bread-fruit tree *(Artocarpus incisa)*, described by Lord Byron as

> "The bread-tree, which, without the ploughshare, yields
> The unreaped harvest of unfurrowed fields,
> And bakes its unadulterated loaves
> Without a furnace in unpurchased groves;
> And flings off famine from its fertile breast—
> A priceless market for the gathering guest,"

is found in a condition of the highest perfection in the South Sea Islands, and grows in most tropical countries. It attains the height of about forty feet, and continues, after the fifth year, to bear fruit

during each successive nine months, for half a century. The fruit resembles a melon with hexagonal markings, is frequently seen eight inches in diameter, and occasionally weighs seventy pounds avoird. Before ripening, the substance of the seedless variety, which is the most highly esteemed, when sliced, washed, and cooked, resembles the crumb of wheaten bread, and contains a large proportion of starch and sugar. But when quite mature, a further quantity of its starch having been changed into sugar, the interior assumes a pulpy, yellow colour and consistence, and is usually eaten raw, although the taste is not so pleasant. During the three months in which the trees are out of bearing, the natives use the unripe fruit, a store of which is buried in a pit, where it ferments. Each day's supply is taken from the pit, rolled into lumps, covered with leaves, and baked on hot stones. Such bread keeps for several weeks.

Whilst the *Artocarpus incisa* is a specimen of a most useful order of edible plants, it is somewhat surprising to find one of the most virulent classed in the same order by botanists on account of corresponding structural features. The *Antiaris toxicaria*, or upas tree of Java, notwithstanding the sensational and exaggerated accounts that have been made from time to time regarding it, is nevertheless a plant of extreme acrimony, and is found occupying the same soil as the salubrious bread fruit. The deadly upas owes its malignancy to the presence in its tissues of a large quantity of strychnia.

Various writers are unanimous in their praise of the bread-fruit. Dr. Solander calls it the most useful vegetable in the world, and urges that no expense should be spared on its cultivation; Mr. Ellis, the missionary, considers it the staff of life to the South Sea Islanders; and Captain Cook says, "Whoever has planted ten bread-fruit trees has fulfilled his duty to his own and succeeding generations as completely and amply as an inhabitant of our rude clime who, throughout his whole life, has ploughed during the rigour of winter, reaped in the heat of summer, and not only provided his present household with bread, but painfully saved some money for his children."

The plantain is a delicious fruit, yielded by the *Musa sapiendum*, a tropical shrub which grows to the height of twenty feet. In appearance it closely resembles the banana tree, though it is larger, while the fruit is more dense and of a less delicate taste. When ripe it is of a pale yellow colour, about twelve inches long, and two in diameter; under very favourable circumstances it sometimes attains twelve inches in circumference, with a length of eight feet; though such gigantic specimens are rarely or never seen in this country.

In the banana, the produce of the *Musa paradisiaca*, we have, according to Humboldt, a vegetable production, than which no other in the world yields, for the small space of ground it occupies, so enormous a mass of nutriment. A plot of ground measuring 1,076 square feet can support forty shrubs, which in the course of a year yield 4,410 lbs. weight of food; whereas a similar space would only produce 462 lbs. of potatoes, or 38 lbs. of wheat. In Mexico, where the banana is extensively cultivated, it is said that the same extent of land under this crop is capable of maintaining fifty individuals, which elsewhere under wheat would not furnish food for two; and the traveller gazes with wonder at the minute and diminutive patches of ground under cultivation around a hut which forms the shelter of a numerous family. In short, the plantain and banana are to the inhabitants of the torrid zone more than corn is to Europeans, or rice to the natives of India and China, as those fruits yield both food and drink. A plantation is formed by the insertion of suckers in the earth, which speedily sprout up in clusters, and yield fruit within the year; it is perpetuated without further trouble than the cutting away of the stem on which the fruit has ripened, and bestowing a slight hoeing to the ground about the roots. As might be expected, the natives possess various ways of dealing with the banana, both before and after maturity, so as to diversify it as food. When quite ripe, it is exposed in the sun and treated like the fig, when it becomes an exceedingly agreeable and wholesome article of diet; or, previously cut when full of starch, it is sliced, dried, and pounded, yielding an exquisitely soft meal. In the latter form, mingled with a little fat and with the addition of pounded cones from the *Araucaria imbricata*, or Chilian pine (remarkably rich in gluten, in which the banana is deficient), it affords both appetising and nutritious food. The Chinese frequently cook the banana lobes, previously deprived of their skin, in oil, brown them before an open fire, and serve them like hot sausages for breakfast; a method of preparation greatly relished by Europeans.

It is not the fruit alone which has placed this invaluable shrub so high in the estimation of the inhabitants of tropical countries. The leaves, which are occasionally seven feet in length, and twelve inches broad, are used for table cloths, or napkins; and, after having completed their domestic duties, are given as food for hogs. The fibrous bark of the species *Musa textilis* is woven into cloth, and in the Philippine Islands furnishes the material for the cordage known as Manilla ropes; whilst the sap which exudes from the soft trunk takes the place of an astringent.

WILLIAM COCHRAN.

FOOD PRODUCTS AT THE WORKMEN'S EXHIBITION.

THE Workmen's International Exhibition, which has just completed three months' existence, has hardly received that attention from the public which it deserved. It is no secret that difficulties of internal administration occurred from time to time; and we think that perhaps, as a result, there was a want of information as to the many objects of interest which made it so well worth a visit. We are not ashamed to confess that, but for the desire of acquainting ourselves with the food products exhibited, we should scarcely have found our way to the Agricultural Hall. Yet the exquisite figure of the Boy Tasso reading was, for itself, worthy of a longer pilgrimage. Our first visit, indeed, made us reluctant to go again; so chaotic was the disorder, so hopelessly unintelligible the catalogue—bridecake, blacking, and dog-soap, figuring in close connection as "food, etc."—and the arrangement of the different collections and classes reminding one of a puzzle-map well shaken in a bag. We were not surprised at the audible murmurs of the exhibitors, generally succeeded by peremptory demands that we should purchase a wonderful top, pop-corn, cosmetics, or photographs! One complaint, heard on all sides, made us feel rather ashamed of our citizens, viz., that the visitors, especially in the evening, distinguished themselves by an acquisitiveness of the most universal description. Nothing seemed to come amiss to the ready hands and furtive pockets; macaroni, toys, rouge, and scent bottles—whatever could be readily snapped up—disappeared; so that at last it became necessary to conceal under lock and key much that was meant to be exhibited. Later visits, however, proved more satisfactory; arrangements were found to be a little more methodical, and an improved classification made the last edition of the catalogue intelligible and useful.

An application to the authorities, most courteously entertained, procured for us the advantage of an introduction to the several representatives of the foreign exhibitors; and, under the guidance of the energetic and obliging superintendent, an opportunity of examining in detail the various natural or manufactured objects which were grouped under Class 16, and so fall under the ken of the "Food Journal."

Few and unimportant were the contributions from Great Britain and Ireland. This is owing, we presume, to the idea that the Exhibition should be mainly devoted to the specimens of the skill of our mechanics and artisans. The next general exhibition will, we hope, present a complete and instructive collection of our food products—both raw materials and manufactures; and we take this opportunity of suggesting that a section be devoted to an involuntary exhibition of adulterated articles, each with the name of the vendor, and the analysis, affixed. The ingenious compilers of Maloo mixture, horse-oil butter, and other such atrocious compounds, will thus have an opportunity of gratuitous advertisement of their wares; and if they are not grateful, the public, at least, assuredly will be so.

But to Islington. Let Erin come first. The Irish display was characteristic. Dunville's* admirable whisky occupied a prominent place; and opposite to their handsome case, the workmanship and arrangement of which were the spontaneous contribution of the employés of the firm—inviting and warding off the visitor—Browne and Co., of Belfast, displayed a well-arranged corrective stock of aërated waters, which fully equalled our best English productions; while the prices were lower than those of our leading firms. The ginger ale and lemonade deserve special commendation; and some varieties of more medicinal beverages, including sarsaparilla, potass, and tonic waters, were by no means unpleasant, and certainly hygienic.

England furnished some splendid specimens of barley and malt from Peterborough; which old cathedral city also sent up confectionery and bride-cake ornaments. We appreciated the covert satire which had placed another case, containing a richly decorated, but not rich looking bride-cake, in ominous juxtaposition to a display of the mystic green and yellow bottles sacred to the windows of chemists' shops.

We regretted to find but one specimen of the many English patents for preserving meat, etc. Mr. G. Warriner exhibited meat and vegetables preserved without salt; we presume, according to the abstract of his patent, by "immersing in glycerine and packing with powdered charcoal, or covering with a mixture of glycerine or osmazome."

E. Schneider,* cook, Cambridge, contributed essence of beef and beef lozenges; while Geyelin's* tapioca bouillon occupied a prominent place in the gallery. This compound is a combination of

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Names marked * have been recommended for Awards (see page 538).

Liebig's extract of beef and granulated tapioca; the soup made from it is palatable, and we should say very nutritious; and it ought to be a useful addition to sea-stock and travellers' stores, and might be used with great advantage instead of the nauseous liquid often administered as "beef tea."

We suppose that the French Coffee Company* may be ranked among British exhibitors. A peculiarity of their coffee, independently of the claim to the improved mixture of several coffees, is the coarseness of the grinding. Connoisseurs know that the finely ground, or rather pulverised coffee loses much of its aroma. We should be glad always to be able to secure as good a cup of coffee as that which we tasted at their counter. In the refreshment department Spiers and Pond reigned supreme, and the building was fringed with their counters, arranged in the tasteful manner familiar to all Exhibition visitors.

A very interesting and important collection represented in a compendious manner the great Australasian colonies. Mr. Tallerman,* of Norton Folgate, placed before the visitors to the Workmen's Exhibition all the advantages of a change to the antipodes: the relative size of the colonies and the United Kingdom was shown in a well executed diagram; while photographic views of localities, and tables of information as to the various occupations open to the workers, were illustrated by many specimens of the productions of Australia and New Zealand. For our purpose we only mention the food, omitting the minerals, etc. Preserved meats were fully represented. The Victoria, Echuca, Ballarat, and Adelaide Companies sent tins of boiled mutton, beef and carrots, minced collops, and beef fit for cooking. The important question of Australian meat has been already ventilated in these pages; and we are glad to record that some most excellent beef received the complete approval of the Jurors. If their opinion assist to dispel the unfounded prejudice entertained against Australian meat by our working classes and many "who ought to know better," a large meed of praise will be due to Mr. Tallerman, who will not regret having made English homes more comfortable, while seeking to recommend colonial ones. For the rest,—Queensland sugar, fine wheat (averaging 67 lbs. per bushel), hops, honey, and New Zealand butter, which could be supplied in abundance but for the lack of dairymaids,—all attested the varied powers of production of that great continent and those islands whose inhabitants still fondly speak of England as "home."

Among foreign countries represented in the Hall, those which were found to have the fullest claim on our attention were the

Netherlands, Denmark, and Italy, in Europe; while Peru and Rio Grande put in an appearance on behalf of the powers of development of South America, which suggested much hopeful speculation as to the future of those parts of the new world. We must, *en passant*, record our thanks to the several active representatives of the Commissions for their obliging co-operation with us; and especially to Dr. A. V. W. Bikkers, of the Netherlands Royal Commission, and Professor de Tivoli, of the Italian, do we express our sense of obligation for the ready kindness with which they received and answered our enquiries.

The whole collection exhibited by the Royal Commission of the Netherlands deserved careful study. We were especially struck with a display of drawings, models, etc., the handiwork of the pupils of the Industrial School at Amsterdam. We doubt whether all our Schools of Art and Design together could furnish such a collection as these Dutch boys, of fourteen years old and under, contributed,—at once to shame and instruct our English promoters of education. We should like to have seen a specimen collection, illustrating the Dutch method of instructing the scholars in the various qualities of food and other materials, both imported and of home growth. Another series whose absence we regretted was that of the rye or black bread so much used among the Hollanders. We noted some fine specimens of buck-wheat from Lisse, South Holland—the grain as it comes from the threshing floor, buck-wheat grits, and buck-wheat flour of first and second quality. The first quality appeared to be a beautiful flour, suitable for fine pastry and cakes—for the confection of which it is largely employed.

Of course, the well-known Dutch cheeses were not absent; but we had no idea how rich and good the familiar globular cheeses could be until tasting the *pâte blanche* and *pâte rouge* of Goede Brothers,* of Landsmeer. They were of a quality seldom, if ever, imported, and were rated at 3*s.* 6*d.* a-piece, each cheese weighing about 4 lbs.

J. G. Bootz,* of Amsterdam, exhibited various liqueurs, the texture, colour and flavour of which, especially of the curaçao and crême de la rose, placed them at the head of their class. Anisette, absinthe, and crême de vanille completed the list. In Holland, these are supplied at 6*d.* to 1*s.* the small bottle; the high duty imposed would, of course, add immensely to the price here; but we began to think—and our experience of the other departments convinced us—that the English consuming public do not know how they are imposed upon by the retail traders, both as regards quality and price of liqueurs.

The production of articles resembling coffee, such as may be used either as cheaper substitutes, or by mixture with the pure coffee, to bring it within reach of the poorest, is a subject of great interest; and while we desire carefully to guard against all fraudulent adulterations, there is no reason against *acknowledged* admixture of other substances—still less against the introduction of any sufficiently good and wholesome substitute. A good specimen of chicory which is sold in Holland at 4*d.* per kilogramme, came from Winterswyk; but we were most struck with an equivalent for coffee exhibited by the inventor, F. Schilling, Alkmaar, North Holland. A common substitute for coffee among the poorer classes is made of burnt barley, which is, we believe, chiefly used as chicory, to mix with the real Java; the new production, however, is expressly declared not to be intended for admixture. It is prepared from a species of white carrot; we could not obtain a precise description, but should say that it much resembled what are commonly known as horse-carrots. We procured a sample, which was believed to be coffee by several persons to whom it was submitted; and the beverage prepared in the ordinary way was certainly as good as the coffee generally supplied in places of refreshment, and much superior in aroma to the fluid usually vended under that name at railway stations. The sample had somewhat deteriorated, owing to an unhappy accident. The exhibitor sent over a large and hermetically sealed glass vase, to be opened at the trials by the Jury; but, alas! *mantua væ miseræ nimium vicina* swept down and shattered the vase, and with it the sanguine hopes of the inventor, who certainly deserved a prize. Even after the consequent exposure to the air, this carrot-coffee, which costs 20 florins (1*l.* 13*s.* 4*d.*) per cask of 20 kilogrammes, decidedly surpassed much that is sold in our grocers' shops. We hope that a good trial may be given to this production; which, one cannot but think, may prove a decided boon to the working classes at home.

Want of space compels us to delay until the next number a detailed account of the contributions of the other countries above mentioned, most of which figure honourably in the award list given on the next page. We conclude for the present by noting that of the only two Austrian contributions, Maraschino, sent by M. Magazin* from Zara, has been recommended for a first prize; and hops, exhibited by G. Tanzer,* of Vienna, for a second prize.

E. Wade.

[TO BE CONTINUED.]

The following is the List of Awards recommended by the Jury for Food, Beverages, etc., as referred to in the preceding article:—

FIRST DIVISION.—COLONIAL PRODUCE.

First Prizes.

A. Soeborg.—Samples of Chocolates .. .. *Denmark.*
J. Picard (French Coffee Co.).—Mixed Coffees.. .. .. *England.*
Solf & Co.—Refined Sugars .. .. (Lambayeque) *Peru.*

Second Prizes.

Geyelin & Co.—Tapioca Beef Bouillon .. .. *England.*
Zaracondegia & Aspullaga.—Refined Sugars, by "Concreto" system .. .. (Cayala) *Peru.*
S. B. Goyburn.—Raw Coffee .. .. (Guadalupe) *Peru.*
Hy. Swayne.—Refined Sugars .. .. (Casablanca) *Peru.*

SECOND DIVISION.—WINES, SPIRITS AND BEVERAGES.

First Prizes.

M. Magazin.—Maraschino .. .. (Zara) *Austria.*
Dunville & Co.—Irish Whisky .. .. (Belfast) *Ireland.*
G. Gianasso.—Vermouth .. .. (Turin) *Italy.*
J. G. Bootz.—Liqueurs .. .. (Amsterdam) *Netherlands.*
Hy. Swayne.—Rum .. .. (Lambayeque) *Peru.*
J. Diehl.—Wines .. .. (San Leopoldo) *Rio Grande.*

THIRD DIVISION.—PREPARED MEATS, CHEESE, &c.

First Prizes.

J. Tallerman.—Fresh Meat Preserved in Fat .. .. .. *Australia Felix.*
S. Burchi.—Confectionery (Vegetable Colouring) .. .. (Pisa) *Italy.*
Gorde Brothers.—Cheese .. .. (Landsmeer) *Netherlands.*
Dr. Manuel Perreira da Silva Ubatuba.—Extract of Beef .. *Rio Grande.*

Second Prizes.

G. Tanzer.—Hops .. .. (Vienna) *Austria.*
E. A. Schneider.—Essence of Beef and Beef Lozenges (Cambridge) *England.*
C. Klug.—Salt Butter .. .. *Denmark.*
G. Andrini.—Tomato Preserve .. .. (Bologna) *Italy.*
A. Guerrini.—Ewe Milk Cheese.. .. .. *Italy.*
P. Ponzano.—Pure Pork Sausages .. .. (Alessandria) *Italy.*
M. Ornati.—Pure Pork Sausages .. .. (Alessandria) *Italy.*
G. Zarri.—Biscuits .. .. (Genoa) *Italy.*
S. Manca.—Macaroni and other Pastes .. .. (Syracuse) *Italy.*
R. Acunzio.—Vermicelli and Pastes .. .. (Teramo) *Italy.*
T. Salvatico.—Vermicelli .. .. (Sassari) *Italy.*
P. Camons.—Preserved Fruits, &c. .. .. (Porto Maurizzio) *Italy.*

[BY BALLOON POST.—Oct. 19.]

FOOD SUPPLIES IN PARIS, AFTER INVESTMENT.

We are beginning to taste the inconveniences, if not the miseries, of a state of siege. The supplies within the walls are large, but great economy and care are requisite notwithstanding. The enemy cannot starve us in six months, but before that time we should be reduced to bread and wine, or nearly so; at present we get vegetables from the zone immediately round Paris, and a large one it is, for the Prussians have not yet dared to establish themselves nearer than Saint Cloud, Choisy-le-Roi, Bondy, and Pierrefitte, beyond Saint Denis. The moment they appear within those limits, the forts send them flying, and knock their artillery and encampments to pieces. It will be seen by the map that the circle is extensive; at the same time, many—most in fact—of the great market gardens have been destroyed, so that vegetables of all kinds are scarce and dear, and potatoes, unfortunately, very bad.

Meat, of course, is the grand difficulty; we are already placed on short commons, and the Government has been compelled to take the distribution into its own hands. The old organisation broke down completely; the butchers in some cases would not submit to the dictation, or, in other words, would not work for the small remuneration of a penny a pound offered to them; and, besides, they are nearly all, as well as their men, enrolled in the Garde Nationale. Under these circumstances, there was no other mode of proceeding than that of the local authorities taking the retail as well as the wholesale business into their own hands, and paying the butchers who were not otherwise engaged, as servants of the municipality; the allowance is 7fr. a day to the master, and 4fr. for each assistant. With the aid of volunteers, nearly the whole of the butchers' shops are now re-opened for a few hours each day.

The stock of provisions was announced on the 24th of September, as follows:—45,000 tons of flour and corn, 24,600 head of cattle, 150,000 sheep, and 6,000 pigs; to which is to be added about 9,000 tons of flour and the rest of the provisions in the hands of the bakers, provision dealers, and private families. But with this there are about 1,800,000 mouths to feed; the number of persons

all classes, except the most ignorant and the most needy. The Government, urged doubtless by the apostles of *hippophagie*, and finding that horses were much more plentiful than bullocks, at once took steps to introduce horse meat into general use, and issued regulations on the subject. All horses destined for food are to be sold at the horse market, during certain hours and on fixed days only; the condition of the animal must be assured by examination by the veterinary inspectors; and they can only be killed in the special abattoirs set apart for the purpose. The horses purchased for food by the Government are weighed alive at the market, at rates not exceeding 40 centimes per kilogramme. The retail selling price of horse beef is fixed at 1fr. 40c. the kilogramme for the best parts, and 80c. for the inferior portions—or 6*d.* and 3½*d.* per lb. English.

The Council of Public Health has made a favourable report to the Prefect of Police on the subject of horse meat. The average number of horses eaten in France per annum was about 3,000; while on the 30th of September last, 273 horses were killed for sale in Paris alone. A few people had become accustomed to this meat during the last five years, and present circumstances, together with the precautions taken by the authorities, have swept away nearly all the prejudice against it. It is declared by the Council to be excellent food, and the regulations in force secure its wholesome condition; the meat and the viscera are examined by veterinary inspectors, it cannot be taken out of the abattoirs until it is stamped in a certain way, and even in the shops it is liable at all times to inspection. These shops were few and far between the other day, and often unsuccessful; now they are to be seen all over the town, and the meat is sold largely in the central and other markets. The expression, horse meat—or horse beef—covers the flesh of mules and asses also; and it has been found that the last-named is generally preferred to the other kinds.

Another rather serious want has been discovered—that of charcoal; the supply of coke is good, but none but the new houses, and only a portion of those, have ranges that will consume coal or coke; the old charcoal furnace is the ordinary cooking stove. To supply this want of charcoal, the authorities are burning the wood cut down around Paris, in the Bois de Boulogne, the Bois de Vincennes, etc.

The Government, at the end of last month, bought up all the wheat and flour in the city, with the exception of what was in private hands for home use; the prices paid were those of the averages of the first half of the month of September, the quality being settled by arbitrators.

The following quotations will give an idea of the state of the markets:—Fresh butter (only to be found in small quantities) at prices varying from 5fr. to 10fr. the pound; salt butter, almost uneatable, 3fr. 50c. to 3fr. 75c.; chickens and pullets, 7fr. to 12fr. each; geese, 16fr. to 24fr. (you may have a horse for about the same price); turkeys, 15fr. to 20fr., without the giblets; rabbits are tolerably plentiful, and fetch 6fr. to 8fr. each. River fish is not scarce, but the prices are rare:—moderate-sized pike, 7fr. to 14fr. each; barbel, small, 4fr. to 7fr.; fine eels, 12fr. to 15fr. each; small tench, 1fr.; a small plate of gudgeons, 1fr. 50c. to 3fr. Vegetables are quoted as follows:—cauliflowers, 75c. to 1fr. 20c.; cabbages, 1fr. 20c. to 1fr. 50c.; fine fresh beans, 1fr. 25c. to 1fr. 50c.—green haricot beans, 2fr. the litre; green peas (very scarce) 2fr. 50c. per litre. And these are market prices, be it remembered. Spinach is just now plentiful, though not cheap; and fruit is very dear—we pay 3*d.* or more for good apples, and grapes are beginning to fail us completely, and are also dear—as are pears, etc.

The absence of so many men from their families, and the enforced idleness of many more, are naturally productive of much indigence, which has to be provided for. Public kitchens are open in all quarters of the town, where good soup is sold at an almost nominal price; and those who obtain a certificate from the *mairie* are allowed a small quantity of meat, or double the amount of horse flesh, and bread almost *ad libitum*. The children are now fed regularly in all the common schools, and arrangements are made for the pupils in the Lycées to remain throughout the day upon the payment of a moderate sum for their *dejeuner*.

The admission of working men into the Garde Nationale is another source of difficulty; a large number are without means, and cannot live upon the 1fr. 50c. *per diem* that is now allowed by the Government. To meet this, the officers and members of the regiment who are better off have, in many instances, established kitchens, where a fair dinner is served at very low rates.

G. W. Yapp.

We take the following item from the *Grocer*:—It is stated in a Boston (U. S.) contemporary that the scarcity of sardines for edible purposes is not due to the desertion of the coasts of France and Spain by those fish, but to the fact that the sardines are pressed into oil, which is shipped to Liverpool for the manufacture of soaps. Within the last twelve months it is reported that 1,000 tons of sardine oil have been imported into Liverpool, where it sold readily at from $160 to $168 gold a ton of 252 gallons—that is, 9 lbs. to the gallon. The demand at Liverpool is mentioned as an inducement for Americans to enter into the manufacture of fish-oil.

POPULAR FOOD ANALYSIS.

No. 8.—TEA—Concluded.

We may, it is hoped, be pardoned for recapitulating the part which this Journal has taken in denouncing the introduction of the Maloo mixture into our markets; because, as will be remembered, our tea exposures commenced in February of this year, while the action of the City authorities only began in March. Nearly every month since, have the sales been watched, samples procured, and the trash exposed; as the under-noted summary will show:—

Month.	Name.	Nature of contents.
February ..	Gunpowder	Common caper, faced with Prussian blue, etc.
April ..	Moning Congou	Redried leaves, etc.
June	Indian green, and Chinese Moning ..	Iron filings, etc.
July	Kaisow	Rice husk, and a variety of foreign matters.

So much for the wholesale market;—now let us turn to the retail, and see how far this bad tea has really entered into consumption. But before doing so, we will briefly consider the various means of ascertaining the purity and value of a sample. The most simple way of arriving at the latter point is the commercial process, employed by tea brokers and merchants, a short description of which may not be out of place. As much tea as will counterbalance a sixpence is placed in a small china pot, of a size fixed by custom, which is immediately filled with perfectly boiling water. The lid is then put on, and the whole allowed to stand at rest, for a period also fixed by prescription, and indicated by the running out of a sand-glass made for the purpose. When the glass has duly run, the infusion is poured from the pot into a cup of somewhat larger capacity, and the leaves are turned out hot and steaming into the lid. Whilst the tea in the cup is cooling, the leaves are carefully examined, and their colour and appearance noted, with the view of forming an opinion as to their age and genuineness. If green tea is being examined, the natural green should be retained after infusion; while, in the case of

black, the old leaves look large, dark, and leathery. The tea is then tasted by being slowly drawn into the mouth; and, after due contact with the palate, it is expectorated; and the flavour and strength having been thus ascertained, the experienced taster at once puts a price on the article. Such, then, is the commercial process, and although to a scientific man accustomed to trust to nothing but the indications of his balance and re-agents, which cannot make a mistake, it may seem somewhat crude, yet it is really the best that can be invented; as there are many points in the value of tea, such as flavour, age of leaf, etc., which no chemical analysis could ascertain. The duties of the chemist must, therefore, be limited to the detection of adulterations—such as discovering "facing," determining its nature, and recognising the presence of foreign and exhausted leaves.

The detection and examination of the facing is simple, as its presence may be at once ascertained, by either examining the tea with a magnifying lens, or by simply washing it off by agitation with cold water. The determination of its nature after removal is accomplished by the usual processes of qualitative analysis, into which it is not our province in these popular articles to enter. We may, however, indicate the manner of detecting Prussian blue, because this "facing" is at once the most dangerous, and yet very easy to discover. Let the green tea be violently shaken up in a little bottle with some cold water, and the resulting fluid quickly poured into a wine-glass to settle. The blue powder thus detached from the tea will subside, and the water having been carefully poured off, it will remain at the bottom of the glass. If a few drops of strong solution of washing soda be now added to the powder, it will change from blue to dirty brown, thus indicating the presence of Prussian blue. The admixture of foreign leaves is best detected by examining the tea after infusion, and observing carefully the form of the leaf, the presence or absence of serration, and the nature of the venation. One of the most common adulterants, namely, the leaf of the willow, was shown in our illustration of the "Maloo Mixture" last month, while the structure of the true tea will be already familiar to the readers of the September number.

The discovery of exhausted leaves is a problem of greater difficulty, unless they are present in a considerable proportion. Three ways may be taken to arrive at a conclusion on this point. 1. The theine may be estimated; but this is a process of some nicety, and the results vary exceedingly, according to the system adopted. The one generally followed is that of our well-known investigator, Dr. Stenhouse, or a modification of it. But even when always using

the same process, the results are so very different in various qualities of tea, that to apply this mode of examination to an ordinary mixed sample is scarcely reliable. To show this, we refer to the table of the results obtained by Dr. Stenhouse, given in our last article. 2. The total nitrogen may be estimated in the tea by the process of ultimate organic analysis, but the observations of Peligot show that, while good *Souchong* gave 6·1 of nitrogen, the same leaves, after complete exhaustion, still retained 4·6 of that element. The difference on which we have to go is, therefore, very narrow; and when we consider that so-called exhausted leaves may have only undergone one infusion, and are not really completely exhausted, the ground on which we have to form a conclusion becomes yet more restricted. 3. The tea may be well dried, and a fixed quantity having been entirely exhausted by boiling with water, the residue may be again dried and weighed. According to Peligot,

100 *parts of fine green Tea contain:—*

Water	10
Soluble portion	47
Exhausted leaves	43
	100

100 *parts of good black Tea contain:—*

Water	8
Soluble portion	43
Exhausted leaves	49
	100

so that this process also has its differences according to the nature of the tea; but, as it is the most simple, we have adopted it in preference to the other two. In examining any tea, the amount of ash ought to be taken, because that is a guide to the mineral adulterations. The ash of good tea ranges from four to six and a half per cent. Many of the common adulterants, such as rice husk, may be detected by the eye; while a magnet drawn through the tea, will at once retain the iron filings, as represented in the illustration of last month.

We now proceed to the results of our examination of samples, to make which as complete as possible, we have called in the aid of an experienced tea-taster, and have had each sample valued at the fair market price. By adding the amount of duty (sixpence) to each of these valuations, and comparing with the cost of the sample bought, the profit which the grocer most probably made in selling the tea, can be very nearly ascertained.

Results of the examination of 31 samples of Tea purchased in London.

No.	Price.	Microscopic and Commercial Characteristics.	Amount of Ash.	Amount of Soluble.	Real Value.
	s. d.				*s. d.*
1	2 0	Rather broken and stalky, mixed with common Indian fannings, common Twankay and Gunpowder; very poor and thin liquor	7·5	32·85	1 0
2	2 0	Very common, broken and dusty, mixed with seeds, rice husks, straw and Indian dust; thin liquor	7·3	30·65	0 10
3	2 8	Common Moning Congou, a little broken and dusty	6·2	32·65	1 0
4	2 8	Siftings of coarse leaves, much broken and dusty; a large proportion of common Twankay, and some iron filings; fair strength	10·2	27·65	0 11
5	2 0	Good common Moning Congou, mingled with some Indian Pekoe flower; not much flavour, but fair strength	7·0	25·65	1 0½
6	2 8	Bold Kaisow, rather broken; deficient in flavour, but fair strength	6·0	32·90	1 1
7	1 4	Very ordinary dust, mingled with broken withered leaf-siftings and iron filings; dark, rough, unattractive liquor	12·0	23·15	0 6
8	1 8	A mixture of Indian and common Kaisow dust; strong, but without flavour	7·3	30·35	0 7½
9	2 0	Mixed broken common tea, containing Kaisow stalks, Indian siftings, low quality of Twankay and Hyson	6·5	31·65	0 10
10	2 0	Common Congou; a little stalky, broken and dusty, mixed with Indian fannings	7·2	30·10	0 10
11	1 4	Very common dust, mixed with a large quantity of small, reddish, unknown seeds, and iron filings, much burnt; liquor of a repulsive odour	20·5	28·25	0 5
12	2 0	A mixture of common Moning and Kaisow, Congou, coarse Twankay and Indian siftings	7·0	34·85	0 9½
13	1 6	Common fannings mixed with broken stalks, rice husks, fractured tea buds, and some iron filings	9·6	27·45	0 8
14	2 0	Bold, broken and stalky, mingled with Indian siftings, coarse Twankay, and fragments of a leaf resembling the Chinese willow	9·5	29·05	0 8
15	2 0	Common old Kaisow, Moning and Bohea broken leaves, some Indian fannings, coarse Twankay and fractured tea buds	7·0	28·85	0 10
16	2 0	Rather stalky and dusty Congou leaves difficult of identification, mingled with some Indian fannings, and a small quantity of coarse Gunpowder	6·5	29·35	0 11
17	1 8	Broken and dusty common Congou, mingled with stalks, Indian siftings, some broken Oolong, rice husks, and the pith of an unknown reed	6·8	26·00	0 10

No.	Price.	Microscopic and Commercial Characteristics.	Amount of Ash.	Amount of Soluble.	Real Value.
	s. *d.*				*s.* *d.*
18 ..	2 0	Much mixed and broken Congou, stalky, dusty, and mingled with Indian fannings and Twankay	6·0 ..	32·65 ..	0 10
19 ..	1 4	Very ordinary Kaisow, Congou sweepings mixed with stalks, and a few ill-twisted whole leaves	8·4 ..	34·15 ..	0 7
20 ..	2 0	A mixture of common Moning and Kaisow Congou, stalky, broken and dusty, exhausted leaves rendered astringent with catechu, present in considerable quantity; the flavour resembles mingled sugar and varnish; is most offensive ..	10·5 ..	23·10 ..	worthless.
21 ..	2 0	Bold, but broken and dusty common Moning Congou, mingled with Indian fannings	6·0 ..	34·35 ..	0 10
22 ..	2 0	Common Moning Congou, stalky and dusty, mixed with Indian siftings, and containing some withered leaves; but yielding a good liquor of fair strength ..	6·5 ..	28·95 ..	0 11½
23 ..	2 0	A mixture of Moning Congou, a little Oolong, Indian Souchong and Namunna teas; stalky, a little broken and dusty ..	6·8 ..	29·65 ..	1 1
24 ..	2 0	Bold common Moning Congou, a little broken and dusty, mixed with a better and a worse kind of common Hyson ..	6·5 ..	34·85 ..	1 0
25 ..	2 8	Mixed common, broken, stalky and dusty Congou, mingled with withered leaves, some Oolong, Indian fannings, a small proportion of coarse Twankay and Gunpowder, rice husks, and scorched disintegrated tea buds	7·0 ..	31·05 ..	0 10
26 ..	1 8	An interesting amalgamation of Indian and China siftings, broken seeds, scorched buds, decayed wood, rice husks, fragments of reeds, stones, and unknown twigs	13·0 ..	30·05 ..	0 6
27 ..	1 8	Very common dust, mingled with stalks and rice husks	6·8 ..	28·05 ..	0 7
28 ..	2 0	A flavourless mixture of very broken tea, mingled with fragments of leaves resembling the Chinese willow, some rice, pea and reed husks, and a few feathers; liquor very mild and not unpleasant, but totally unlike tea	7·0 ..	31·60 ..	0 3
29 ..	2 0	Bold common Kaisow Congou, a little broken, stalky, and burnt; some strength	5·8 ..	30·30 ..	0 3
30 ..	2 0	Very broken and dusty common Congou, containing many stalks, some Indian siftings, rice husks and coarse Twankay; yielding a dark liquor, but thin	6·8 ..	30·10 ..	0 8
35 ..	2 8	Fair Congou, Souchong kind, a mixture of young Congou and common Souchong leaves; flavoury, and possessing considerable strength; a slight trace of iron filings	12·0 ..	28·90 ..	1 3

Having thus seen the state of the London market, let us glance at the following results of the examination of four samples of tea procured in Birmingham:—

No.	Price.	Microscopic and Commercial Characteristics.	Amount of Ash.	Amount of Soluble.	Real Value.
	s. d.				*s. d.*
31 ..	not stated	Common Caper: a repulsive mixture of common Caper, various irrecognisable broken leaves, chopped stalks, tea husks, masses of lie tea, and some iron filings; thin, disagreeable liquor	16·5 ..	28·60 ..	0 2
32 ..	„	A mixture of common Hyson, Gunpowder and green dust, adulterated with fragments of bone, hard wood, brown bread crusts, tea-seed husks, stones, and sand	13·0 ..	30·80 ..	0 7½
33 ..	„	Common Moyune dust, containing a large proportion of iron filings and sand	19·6 ..	25·70 ..	0 4
34 ..	„	Common Caper; containing a large proportion of whole and partly broken rice grains, faced as well as the tea, with plumbago and lamp black; several fragments of plumbago scattered through the sample	5·2 ..	17·60 ..	0 8

Such a picture needs no comment on our part, seeing that out of the whole thirty-five samples at least sixteen were highly adulterated, and many of them quite unfit for human consumption. The fault in these cases does not lie so much with the grocers, who naturally buy the cheapest article to enable them to compete with their neighbours, as with the Government, which permits the sale of and takes duty on such trash. We have heard that there is a staff of chemists employed at Somerset House, and that there is also an institution called the "Queen's Tobacco Pipe," which quickly smokes up all goods not worth the duty; and we can only hope that the former gentlemen will soon have the power conferred upon them of causing the Maloo mixture, and all kindred rubbish, to be put in the "pipe" as soon as possible, without the merchant having the option of exporting it when detected. It is almost too much to expect that our tea brokers, although a wealthy and intelligent set of men, will agree to refuse to deal in the mixture; but we trust that the continued exposures which have taken place may bear their fruit, and that the dealers in this bad tea may share the fate of the sugar man, made famous by the poet Grainger in the lines—

> One year the fraud succeeded; wealth immense
> Flow'd in upon him, and he blest his pains.
> The next, the brokers spurn'd the adulterate mess,
> Both on the Avon and the banks of Thames.

J. Muter, Ph.D

SALMON LEGISLATION.

NEARLY everyone who has had occasion to refer to the literature of our rivers must be familiar with the old story of a time when salmon was so abundant, that even apprentices stipulated that they should not be required to dine on it for more than a certain number of days in each week. The tradition exists in every county in England where there is a river with any pretence to be called a salmon stream; and it is quoted, with an almost wearisome repetition, in support of the theory that salmon were once as plentiful as they are now supposed to be scarce, and that they were formerly as cheap as they are now assumed to be dear.

But the tradition, even if it be accepted in its entirety, really proves hardly anything at all. It might, in fact, be as logically argued that, because land is dearer now than it was a century ago, the number of acres in the country was less now than it was then. The same causes which have contributed to an increase in the value of real property have occasioned a tantamount increase in the price of salmon. If the population of the country has within a century and a half increased fourfold, and the supply of fish has remained stationary, the price of the latter must almost necessarily have risen in a corresponding ratio to the increased demand for it.

Nor has the price of fish been affected only by the growth of population. A hundred years ago, the fish that was caught 200 miles from London was, from the very nature of things, of necessity sold on the spot. It is true that the London market was, to a certain extent, supplied with salmon, transported in swift vessels, fitted with wells, from Newcastle and Berwick; but it is equally true that this was an exceptional occurrence. If there was a great catch of fish on the Eden, the price of salmon fell at Carlisle, but was not affected in London. The Cumberland apprentices were surfeited with a dish sold in their neighbourhood for a few farthings, which the London aldermen regarded as a delicacy, and would have gladly purchased for as many shillings.

Such a state of things is simply impossible now. Ice and railways have together enabled us to equalise prices, and we are suffering from the reverse of that state of things which our ancestors had to endure. In their days a great catch of fish supplied

the whole neighbourhood with cheap food for a week. In our time, every fish that is caught is immediately sent off to one of the great centres of population; and it is a common complaint among those who live near salmon rivers, that they never have an opportunity of buying a salmon.

Even then, if our population, instead of quadrupling, had remained stationary, it would be useless to hazard a comparison between then and now: every feature in the landscape is changed —all the conditions are altered. Then, a large catch of fish had necessarily to be disposed of in the immediate neighbourhood of the river; now, they are exposed to the competition of a population, in England and Wales alone, of 20,000,000 souls.

It may no doubt be objected that the argument which we have used to illustrate the present price of salmon cannot be sound, unless it can be shown that a corresponding increase has taken place in the price of other articles of food. If the price of wheat and mutton has not risen as rapidly as the population has increased, why should there be an exceptional rise in the price of salmon? But the answer to the question is very easy. In the first place, large tracts of uncultivated land have been taken into cultivation with every successive growth of the population; and, in the next place, improved machinery and a better system of agricuture have enabled the old land to produce, acre for acre, more food than it did formerly; but, above all these considerations, the repeal of unwise laws has enabled us to draw our supplies of food from the entire world. Various causes, therefore, have prevented our experiencing any scarcity in supplies of food, and especially of corn. The price of meat, an article less capable of transport, has indeed risen with greater rapidity, but the causes which have contributed to raise the price of meat have had infinitely more effect on the price of salmon. We cannot extend the area from which our supplies of fish are drawn. The same rivers which water the country now, also watered it in the good old days when the apprentices stipulated against the food of aldermen. So far from increasing, the importation of fish from abroad is steadily declining. Our foreign supply is at the present moment so small that it is hardly worthy of consideration. All the salmon consumed here must be drawn from the rivers of the United Kingdom; and it is scarcely fair to complain, if these rivers are less capable of supplying 20,000,000 persons than 5,000,000, with one kind of food.

To suppose, therefore, that under any possible circumstance the time can ever recur when salmon may be the normal food of the poor as well as of the rich, is to entirely overlook the altered con-

dition of the salmon question. The enthusiasts who hold out hopes of salmon at *1d.* or *2d.* a pound either overlook or ignore the facts which contradict their prophecy. Salmon may no doubt be materially increased. During certain months of the year it may be possible to place it constantly on the tables of the middle classes; but to suppose that it can be made as plentiful as mackerel or pilchards is to mistake the limited area of our inland water for the almost infinite capacity of the ocean.

But, though the supply of salmon must necessarily be always limited, there is no reason why it should not be much larger than it is now. At present the value of the whole of the salmon sold at Billingsgate in a year does not much exceed 200,000*l.*; and this comparatively insignificant amount is drawn not only from Scotland, Ireland, England, and Wales, but from the more distant rivers of Germany and Norway. It requires very few illustrations to prove that this amount is capable of a splendid increase. One river alone, the Suir, at Waterford, has been frequently stated to produce 40,000*l.* worth a year. It is doubtful whether the whole of England and Wales produces more than twice this amount.

There are, perhaps, three causes why this production is so small—first, the unsuitability of the present law; secondly, the obstruction of fish in their way to the spawning beds; and thirdly, the pollution of water so as to render it unfit for fish to inhabit.

The first cause has arisen from the determination of the legislature to place the whole country under a common law, a determination which is founded on the erroneous hypothesis that all migratory salmonidæ migrate at the same time, and are of the same size. Nothing can be more fallacious than either of these propositions. So far from the fish entering all rivers at the same time, it is certain that their times of coming and going are entirely different in different localities. In one river, clean fish may be caught in every month from January to August; while in others it is useless to put in a salmon net till the early days of autumn. To inflict on rivers so different in their character an uniform close time is practically to prohibit in one or other of them the capture of the fish at the only time when they can be caught—to knowingly forego a valuable harvest. What would be thought of a law that forbade the Highlander to cut his oats after the middle of September? Yet such a law could not be in principle more wasteful than that which compels the Cornish fisherman to put away his nets at the end of August. It cannot be too widely known that we are wilfully reducing our supplies of salmon food by refusing to allow the fish to be caught in the only months in which, in some rivers, they can be profitably taken.

Nor is this the only anomaly in the present law. The same Act of Parliament which enforces an uniform close season goes on to prescribe the same mesh in every river. If in every river migratory salmonidæ were of the same average size, no exception could be taken to this legislative provision; but in some rivers fish are of an average weight of nearly 10 lbs., while in others they barely turn the scale at 1 lb. To prescribe the same mesh for these two kinds of rivers is to enable the fishermen in the former to use the most destructive net which it is possible to devise; in the latter to prohibit the gathering, in any legal manner, of the harvest which nature has provided. Again we find ourselves wilfully neglecting the supply of food which nature constantly offers to us. The peal, the sewin, the sprods, *et hoc genus omne*, or, to write more correctly, *hæc species omnis* of salmonidæ are as safe as laws can make them from the legal fisherman.

The second cause which is diminishing the produce of our salmon rivers is unquestionably the existence of high obstructions, which bar the fish out of the waters best suited for their breeding-grounds. If it be true that the produce of a river must, to a great extent, depend on the extent of the spawning-grounds, it follows that any decrease in the latter must be attended with a corresponding diminution in the former; and it requires very few words to show that if a weir be built across a river, over which the fish cannot pass, its spawning-grounds may be wholly or partially cut off. Unfortunately, in a country like our own, where water has been and is still used extensively as a motive power, obstructions of this description exist in almost every river; and unhappily their right to exist has been so seldom questioned that practically their owners have, in nearly every case, acquired a prescriptive title to the enjoyment of them. The cultivator of the Salmon farm finds himself face to face with a difficulty which, had it not been for the apathy of his predecessors, would never have been permitted to be created at all. But he has done much to remedy the neglect of his forefathers. All over the country, ingenious contrivances are being devised to enable the salmon to pass over obstacles which would otherwise be impracticable; and, in nearly every considerable stream, the obstructions are in this way being remedied, as quickly as the most zealous could desire. There is, indeed, some reason to fear that in many cases the process of building passes is being carried on too rapidly, and that larger areas are being opened up than can effectually be protected. To allow fish to pass into an unprotected country is not merely to hand them over to the power of the poacher, but to throw temptations into the poor man's way which in themselves

are sufficient to convert honest men into poachers. While, then, we must admire the zeal of those who are always working to restore the fish to the streams from which they are excluded, we must remember that sound policy requires that the works of protection and restoration should proceed hand in hand. It is far better to confine the fish in 10 miles of a well protected stream than to scatter them over 100 miles of an unprotected country.

The evil which a weir produces is capable of easy definition—the fish are cut off from the river above it. Unhappily, pollutions occasion a still wider injury. The evil of the weir is measured by the amount of river above it; but no one can tell how far the effects of a pollution may be seen below the point at which it enters a river. Fish may be poisoned by the washings of a mine, miles below the outlet of the mine water. It has even been asserted that sea fish have been destroyed on the coast of Wales by the poisonous water of the Ystwith and the Rheidol. But a growing sense of the value of pure water is gradually impressing the whole country with a necessity of dealing with the evil of pollution. The ablest chemists in the kingdom are busily solving the sewage problem; manufacturers are slowly admitting the truth of Lord Palmerston's saying, that "dirt is matter out of place," and are gradually awakening to the conviction that true economy suggests the propriety of retaining valuable matter, instead of throwing it away. An able Commission is carefully investigating the whole question, and everything seems, consequently, to point to a satisfactory termination of the pollution difficulty. But much remains to be done. Any increase in our natural wealth implies a corresponding increase in our manufactures and mines; and mines and manufactures are all calculated to cause pollutions. We have not only an existing evil to remedy, but an increasing evil to encounter. But unless we are prepared to deal with it we cannot hope materially to increase the produce of our salmon farms; and we must submit to still greater evils, affecting our health and our comfort, which are the direct consequence—the almost inevitable consequence—of foul water.

SPENCER WALPOLE.

M. A. PETIT contradicts the ordinary belief that the free acid of the grape is gradually neutralised. He says that the ripe berries contain as much alkali as the green ones, and that the reason for the decrease of the acids is to be found in the fact of their being transformed into sugar. Even the leaves and vine-branches contain a considerable amount of sugar and some free acid. The young leaves are found to yield on an average 20 to 23 grammes of sugar per kilo.

AUSTRALIAN PRODUCE.

REFERENCE has several times been made in the pages of the "Food Journal" to Australian preserved meats, as imported into this country. In order, however, fully to test the value of Australian produce generally, the experiences of other countries should be weighed carefully in the balance, and enquiry instituted as to how far the opinions of others agree with our own. The Government of India has recently taken up this question, and inspected a number of samples of such staple articles of Australian produce as can be regularly supplied in quantity, and which, it is believed, can be furnished to any amount, at rates contrasting favourably with those now paid by the Government of India. These importations consisted, with one or two exceptions, of articles of food. Upon their arrival at Calcutta a committee was formed to open and examine them. The following is an abstract of the report upon each article, many being represented by several samples forwarded by different shippers:—

WHEAT.—The samples of wheat inspected were of a fine white uniform grain, equal in quality to the best Patna Doodia wheat, and far superior to the wheat usually sold in the bazaar, and used for making flour by the Commissariat Department. The value of the wheat was reported by the Executive Commissariat Officer to be *4r.* 14*a.* 6*p.*, or nearly 10*s.* per maund of 82 lbs.

FLOUR.—The flour was of excellent quality and colour. It stood the test of the journey to India packed in canvas bags, and appeared sweet and fresh; a portion of it was made into bread, and the loaves were very generally approved by the committee, who considered them superior to the bread supplied to the troops, contrasted with Indian flour as manufactured by the Commissariat Department. This flour would sell readily in the Indian market at from 11*s.* to 11*s.* 6*d.* per maund of 82 lbs. It was considered nearly equal in quality to the best American and Cape flour. Both the latter are always packed in barrels; and for India also this is considered the best method of preserving flour.

ALE AND PORTER.—Several bottles of ale and porter were tasted by the committee. These varied in quality, some of them being

sour and hard to the taste. The ale in some instances appeared to be over ripe and unfit for use; the quality on the whole was doubtful; and the opinion of the committtee was that the bottled ale and porter were not equal to that usually imported for the Indian market, and that it would not sell. The two casks of beer shipped by Hanpen and Catchlove appeared to be of better quality than that in bottle, resembling in taste and character the Hill beer. To ensure a sale, it would have to be sold at a much lower rate than the English beer, which can be obtained at from 6*l.* 10*s.* to 8*l.* per hogshead.

Biscuits.—All the samples of biscuits presented to the committee appeared of excellent quality and carefully manufactured, very sweet in taste, and moderately priced. They were considered equal in quality to the machine-made biscuits received from England.

Jams.—The samples of jams were much approved, being carefully prepared and containing a good flavour of the fruit. As a rule, they were superior to those usually sent for the Indian market, and very much cheaper.

Wines.—The wines of Australia all partook much of the same character, the red wines resembling Burgundy, light Clarets, and Cape Pontac; whilst the white wines were all more or less similar to Hocks and Sauternes. Most of them appeared to be very sound, with a good flavour of the grape. Amongst the best were those shipped by T. Hardy; his "Morooroo Carbonet" and "Morooroo Verdeilho" were both excellent wines, the first resembling a full-bodied Claret or Burgundy, and the other, a white wine, not unlike Chablis. The prices affixed seemed moderate, and it is not improbable that considerable quantities of these wines might be sold.

Pickles and Sauces.—The pickles and sauces submitted appeared of fair quality, but not equal to English importations; and it is doubtful if it would be advisable to send these articles to India, unless there were a marked improvement in them.

Preserved Meats.—The committee examined very carefully the samples submitted by the Adelaide Meat Preserving Company. The contents of the tins were fresh and in good preservation; the mutton was of good quality, and quite equal to the English preserved meat. Some packages of preserved meats, which were put up in canvas, arrived in a putrid state. All preserved meats should be hermetically sealed.

Confectionery.—Two boxes of confectionery, shipped by A. Irwin, were duly examined by the committee, who considered them to be of excellent quality and manufacture.

CORDIALS.—These were not approved, although those from the house of G. E. Martin were better than others. The cordials, as a rule, were badly manufactured, and were not equal to the same description procurable in Calcutta. In justice to the shippers, the committee remarked that some of the cordials had never been heard of by them, and possibly required to be better understood to be appreciated.

BUTTER.—A case of butter from M. C. Davies arrived in excellent order, very fresh and sweet, and admirably adapted for ship use, being fresher and purer than any imported from other countries and procurable in Calcutta.

PACKING.—Generally the packing of the several samples of Australian produce had been carefully attended to; but the committee recommended that flour should be sent out in barrels, as being thus less liable to injury from damp or other causes than when packed in canvas bags. Many of the articles inspected by the committee were injured from the fact of their being badly and insecurely packed.

The samples generally, as regards quality and price, contrasted favourably with the usual run of importations from the English and other markets.

F. C. DANVERS.

At the late meeting of the British Association at Liverpool, a very interesting paper was read by Dr. Moffat on the relation of the geology of any given district to its sanitary condition. He pointed out how the dwellers on the new red sandstone of Cheshire took into their system a fixed proportion of iron with the wheat which they eat, derived of course from the peroxide of iron that colours the sandstone so deeply; and he contrasted those health-giving qualities with the anæmic condition that prevails in the carboniferous districts, of which iron is a very scanty constituent. There is great reason in this theory; for if plants are affected by the geological constituents of soil, why not human beings?

THE *Grocer* calls attention to an old trick of Union contractors, which has been extensively played of late. It is the importation from Cork of empty butter firkins. This apparently simple purchase is, however, highly and unpleasantly suggestive of the material which is packed in the firkins and sent in for the benefit of the paupers, as good Cork butter. After the recent revelations concerning butter manufacture, one really scarcely likes to guess even what the wretched inmates of the Union may be obliged to swallow. To complain to guardians is simply a waste of time; and the only remedy that we can suggest is one put forward at the Social Science Congress at Newcastle-on-Tyne, viz., to have a Food Department, under whose control a staff of inspectors should be appointed, with full power to examine any and all supplies of food and drink for workhouse consumption. This is not merely a measure of justice, but of common humanity.

DOMESTIC RECIPES.

The Editor desires to appeal to his readers, and especially to the ladies, for contributions of recipes for cheap, tasty, and serviceable dishes, both for poor households and those of the higher classes.

CHEESE CAKES.—*(From an old M.S.)*

Take 4 quarts of new milk, put rennet to it, and when it is come, tie it up in a cloth, so that all the whey may drain out; then take 1 lb. of butter, and with a spoon, rub it with the curd thro' an hair sieve, and add to it the yolks of 12 eggs, 12 spoonsful of rosewater and 2 grated nutmegs, sugar to your taste, and 1 lb. of currants clean wash'd and picked. Mix together and so bake them.

For the Crust.—Take 1 lb. of fine flour, 6 oz. of sugar, the yolks of three eggs, two spoonfuls of sack, and as much butter as will make it into a paste without more wetting; it must be rolled thin.

BURNT CREAM.

Boil ½ pint of milk together with a bay leaf and a piece of cinnamon; add to it the yolks of four eggs well beaten, ¼ pint of cream, a spoonful of flour, and fine sugar sufficient to make it sweet; keep it stirring over a gentle fire until it is as thick as a custard; then pour it into your dish, strew it over with sugar, and brown it with a salamander.

TO DRESS SPINACH.

First pick the leaves from the stem, and, when well washed, throw them into a large saucepan of boiling water rather salt; boil them fast for about ten minutes, and strain on the back of a sieve or cullender; press them in a napkin and squeeze out all the water that remains. The spinach must be then put into a stewpan with a little butter, pepper and salt; and, about ten minutes before serving, placed on the stove to be made hot; add nearly half a teacupful of cream; pile it on the dish, and serve.

SPINACH SOUP.

First prepare your spinach as above directed; boil it about six or seven minutes; after pressing the water out, put it into a stewpan with some butter, a little flour, a small onion, and two or three sprigs of parsley; fry it on the stove for a short time, and then add a little good stock, and let it simmer slowly for about twenty minutes; next pass it through a fine hair sieve, put it back into the stewpan, add a small pat of butter, a piece of glaze, a little sugar and salt; let it boil, and serve with little croutons of fried bread.

CANAPES OF ANCHOVIES AND CHICKEN.

(A most excellent breakfast dish.)

Cut some pieces of bread either square, oblong, or round, and fry them on one side in butter; then take some cold chicken; pound it, and pass it through a wire sieve; season with a little salt and cayenne pepper; put in a little cream, make it hot, and spread each piece with the preparation; on this lay some small slices of anchovies.

NOTES OF THE MONTH.

THE Royal Horticultural Society held an Exhibition on the 5th of last month, which was characterised by a display of edible and poisonous fungi. We trust that this will become a permanent feature in the autumnal exhibitions, although we should like to see a better arrangement. The most striking collections were those of Mr. English and Mr. Worthington Smith, that of the former being conspicuous for the good taste by which the brilliant colouring of the specimens was brought into play; and that of the latter by the "frightful examples" made of the poisonous kinds, in the shape of warning labels for the protection of the incautious eater.

WE are very glad to observe that a Commission has been sitting at Cardiff to examine into the truck system which has been for years so prevalent in the iron and coal districts of South Wales. There are two sides to every question; and, naturally enough, the masters and employers tell a very different story to that of the men. But, while making every allowance for the feeling of "class," which is at the bottom of so much of our social discontent, those who know the South Welsh coal basin, know that the workmen have too much reason for complaint; and although the facts deposed to must be taken *cum grano salis*, and a considerable allowance made for Welsh impulsiveness, and (we must add) a Celtic disregard for strict truth, there is doubtless a lamentable prevalence of truck, by which the independence of the workmen is sacrificed, and the growth of all habits of prudent forethought utterly prevented. We hope to return to this important subject very shortly.

ALBINI asserts that the edible chestnut contains 22·8 to 23 per cent. of dextrin. Herr Aug. Burgemeister, of Jena, has, according to his recent researches, discovered no trace of dextrin in the market article.

LEAD POISONING.—We have received very important communications on this subject from two of our contributors; the first from Professor F. Crace Calvert, of Manchester, who says:—"In our city great numbers of private houses have on the first floor a bath-room and lavatory, in which is a leaden cistern, supplying the hot water required. The contents of the cistern are heated by means of a continuous current of hot water, fed by a boiler placed behind the kitchen range on the ground floor. The cooled water from the cistern returning to the boiler is of course charged with all the lead dissolved from it; and as the occupiers of these houses are either not aware of the action of water on lead, or do not reflect that the water which they take from the kitchen range for domestic purposes has circulated through the cistern above, it is not surprising that many of them fall victims to lead poisoning." Professor Church, of the Royal Agricultural College at Cirencester, points to a similar danger, resulting from the use of gazogenes for preparing aërated waters. He says:—"I have examined a large number of different waters—English and foreign, old and new—and I find one defect universal. The upper part of the long glass tube (through which the aërated liquor is forced from the lower vessel) is fitted into a tube of pewter. The aërated water standing in this dissolves some of its lead; and the first wineglassful of water drawn each time that the apparatus has been left to itself, turns brown when tested with hydro-sulphuric acid. Why should not the new tin-lined lead tubes be used for the metal fitting in which the little spring-piston of these machines works?"

OUR EXPERIMENTAL COLUMN.

Under this head will be given a series of short notices on any new articles of diet, or domestic sanitary matters, that may come before us. Being the results of personal experiment, our readers may regard these reports as trustworthy records of the various novelties that claim the patronage of housekeepers.

CACAOINE.—We should scarcely have thought that any new form of cocoa preparation was possible amongst the thousand and one varieties of this class of dietetics. Messrs. Epps and Co., however, in regard to their *Cacaoine*, just introduced to the public, state that by a new process to which the nibs are subjected, the principal part of the oil is effectually removed, a *thin* beverage, well adapted for afternoon or evening use as a substitute for tea, being the result; whilst ordinary cocoa, owing to its naturally heavy consistence, is more suitable for breakfast only. The peculiarly smooth and delicate flavour of *Cacaoine* will, in addition, be a great attraction to all cocoa drinkers; and this appears to us to be partly the result of the extreme fineness of the powder, which allows of a very rapid mixing with the boiling water.

MESSRS. W. J. COLEMAN & CO., of St. Mary-at-Hill, have requested us to call the attention of the benevolently inclined to the fact that they will be glad to supply their "Extract of Meat," as manufactured by Mr. Tooth, of Sydney, New South Wales, for the benefit of the sick and wounded in the present war, at the very lowest prices. Although this preparation cannot exactly be classed under the head of a novelty, we gladly take the opportunity of giving our testimony to the excellent and nutritious qualities of the extract.

A NEW JUG.—The difficulty of keeping water hot for any length of time in an ordinary hot-water jug is one that is constantly making itself felt, and particularly in the winter months, by the lazy individual who knows that his shaving water is getting rapidly cold, before he can muster up courage to turn out of bed. We have seen a most ingenious jug which will obviate these little annoyances. It has two linings, between which is a cavity filled with powdered cork, the very best non-conductor that can be found. It therefore will be equally useful for keeping water cold in summer. Mr. Kent, whose name is dear to housekeepers for the number of his labour-saving machines, is, we understand, introducing these useful jugs in various metals—plain, electro-silver, and electro-gilt—and they are highly ornamental for dessert tables, etc.

BOOKS RECEIVED.

"On Medical Pepsine." By R. V. Tuson, F.C.S.
"Cookery for the Times." By B. M. Bemrose & Sons.
"Vital Statistics of the Borough of Salford for 1869."
"Journal of Cutaneous Medicine." J. Churchill & Sons.
"The Home Nurse." By Le Hardy. Hardwicke, 192, Piccadilly.
"Contributions to Natural History." By a Rural Dean. Blackwood & Sons.

THE

FOOD JOURNAL.

FOREIGN OFFICE REPORTS ON THE ADULTERATION OF FOOD, ETC.—PART IV.

WE resume the continuation of reports from the United States, commencing with one by Mr. Acting-Consul Briggs, from NEW ORLEANS, where both legislative and municipal enactments are in force respecting the adulteration of food and drink. The following articles are taken from the latest publication (1870) of the laws and general ordinances of that city, together with the Acts of the Supreme Court and the constitutional provisions relating to the city government:—

"Art. 444.—No person shall adulterate in any manner calculated to injure health, whether for the purpose of sale or otherwise, any substance intended for food, any liquor intended for drink, or any drug or medicine; or shall offer for sale any such adulterated substance, under penalty of not less than $5 nor more than $50 for each and every offence.

"Art. 445.—No person shall sell, or offer for sale, or expose in any public place, or keep in any private place, any blown, stale, decomposing, putrid, or unwholesome provisions, or tainted meat, or fish, or any food or drink that is impure or calculated to be injurious to health, under penalty of not less than $25 or more than $100."

There have been occasional arrests for adulteration of milk and the selling of unsound meat, and persons have now and then been fined; but violations still occur, which are frequently overlooked. It is strange, however, that no notice is ever taken of the adulteration of liquors or of drugs, though the former are well known to be mixed with poisonous materials to a frightful degree, sufficiently expressed by the names of certain beverages, as familiar to the drinkers as damnatory to the drink. "Rot-gut," "rifle whisky," "kill at sixty yards," are telling epithets, and do not require explanation; yet the law which provides for their prevention is a perfect dead letter.

The sanitary inspectors of the Board of Health lately caused an examination to be made of sixty specimens of milk, with the following

Acting-Consul Cortazzi, dating from MONASTIR (Turkey in Europe), says that the Penal Code of the 17th Zilhidge, 1278 (14th June, 1862), provides against adulteration by authorising the *Belda*, or municipality, to enquire into complaints, to prevent abuses, and to punish offenders. Article 257 states that all vendors of meat, fish, fruit, and vegetables shall on the first offence be fined from 6 to 10 *bishlicks* (5*s.* 6*d.* to 9*s.*); on the second, 12 to 20 bishlicks (11*s.* to 18*s.*); and on the third, 24 to 40 bishlicks (22*s.* to 30*s.*) Should a culprit again offend, he is liable to such punishment as the municipal court may award, subject to approval of the *Idaré-Miglissi*, or Council of Administration, at which the *Mutesariff*, or Governor, presides. It rarely happens, however, that an offence of this nature is committed a third time, seeing that an imprisonment of long duration, and, consequently, utter ruin to the culprit, would be the result.

At TREBIZOND (Turkey in Asia), according to Mr. Consul Gifford Palgrave, adulteration, whether mechanical or chemical, does not fall under direct penal legislation, though it becomes indirectly the object of such by virtue of the following general enactment:—"The exposure for sale of any article of food or drink, raw or prepared, of unsound or unwholesome condition or quality, meets with an admonition to desist for the first offence; for the second, a fine of 1 bishlick (11*d.*), besides confiscation of the articles in question; for the third, a fine of from 15 to 30 bishlicks (14*s.* to 28*s.*); and for further offences, either imprisonment for from one to thirty days may be inflicted, or the withdrawal of the official license, without which no person can open a shop or exercise a profession." The enforcement of these regulations is confided to the police, acting under the direction of the Medical Officer of the district and the Town Council, to which authorities are committed the inspection and regulation of food and markets. But the regulations are defective both in themselves and in the machinery by which they are worked. The police, underpaid and often not paid at all, find that connivance suits their purpose better than detection; while the official district doctor is usually some low French quack or Italian refugee. The reason of this is, that the conditions of Ottoman service are such that no European of any professional status would submit to them; while the Town Council and Magistrates are mere creatures of the *Walee*, or Provincial Governor, whose interests lie any way but in the performance of his duties. Nevertheless, as far as the evil of adulteration is concerned, it is less than might be expected, for the following reasons. Articles of food are of home produce and preparation, or imported. As regards those

of home produce, Anatolian ignorance and routine sufficiently preclude the danger of chemical admixture; while mechanical adulterations, such as with sand, chalk, starch, or spurious grain, are so perceptible to the senses, that it is next to impossible to add them in a country where every master and mistress of a house have been from earliest youth their own daily purveyors from shop or market. Home-made articles of drink are of the simplest kind among Mahometans, *i.e.*, six-sevenths of the inhabitants, to whom the use of fermented liquors, and consequently of any drinks worth adulterating, is prohibited. Even the country-made wine, occasionally drunk by Christians, is protected against admixtures by its cheapness and inferiority. Imported articles of food are rare, and their use is chiefly confined to the small European or Levantine population. But imported drinks are more general, Greeks and Americans freely partaking of them; though in these cases the extravagantly heavy duties, which are levied under various titles, undoubtedly encourage adulteration by rendering the importation of sound and good qualities unremunerative. The local sanitary legislation, however, does not interfere with the composition of foreign-made food and drinks.

At Bosna-Serai (Turkey in Europe), according to Mr. Consul Holmes, paragraph 223 of a decree called the *Kanoun Djeza* (Law regarding Fines and Penalties), forbids the adulteration of food and drink under a penalty of from one month to one year's imprisonment, and a fine of from half a gold *medjidieh* to 5 gold medjidiehs (9*s.* 4*d.* to 4*l.* 12*s.* 2*d.*), provided that the materials used for admixture are not injurious to health; should they be so the penalty is three years' imprisonment. Paragraph 257 orders that all spoilt vegetables, fruit, and bad fish be thrown away, and the vendor fined from 6 to 10 bishlicks (5*s.* to 8*s.*). The agents of the municipality and police are required to enforce these enactments.

Sir H. Elliot reports that at Therapia (Turkey in Europe) the Penal Code of the Mahomedan year 1287 provides that all rotten fruit exposed for sale shall be thrown into the sea, and the vendors fined from 30 to 50 *piastres* (5*s.* 7*d.* to 9*s.* 4*d.*). All tradesmen who adulterate food, or mix chopped straw with barley, or beans with coffee (though not injurious to public health), shall be fined from 5 to 100 piastres.

Mr. Consul Stuart states that at Janina (Turkey in Europe) the police are empowered to exercise a general vigilance in respect of all articles of food and drink exposed for sale; and any offence against the regulations is punished with fine or imprisonment, or both. The usual methods of adulterating grain and flour,

by admixture with inferior and cheaper qualities, are well known and frequently practised; but cases of detection or punishment are rarely heard of.

In the ISLAND OF CRETE there are no legislative enactments respecting adulteration, and the custom prevails that two members of the Municipal Council, assisted by a Medical Officer of Health, shall daily inspect the quality of all food sold in the markets, and destroy what they find to be injurious. It is a common adulteration to mix coffee, ground for retail sale, with dried vetches and barley, both of which are considered very injurious to health. Most of the spirituous liquors and some of the wines are more or less adulterated by the introduction of very strong spirits imported from Austria.

Mr. Consul Abbott, writing from ODESSA, quotes the law that exists in Russia, as found in paragraph 115 of the Code of 1867:—"Those who are guilty of preparing for sale or of selling food or drink of a quality injurious to health, or such as is corrupted and manufactured in metal vessels of a quality pernicious to health when used for the preparation of food, are subject to arrest and imprisonment for a period not exceeding one month; or to a penalty not exceeding 100 roubles (12*l.* 10*s.*), together with seizure and destruction of such food and drink, or of such vessels." Though this law seems to be sufficiently clear, it is very inadequately enforced at Odessa, and cannot be said to meet the evil properly.

Mr. Vice-Consul Stevens reports, with respect to NICOLAIEFF, where he resides, that these regulations are never enforced there; and that, though the police have a right to enter any provision store or spirit or wine shop, they never do so with the above object. He remarks that the system of adulterating food in these countries is of comparatively recent introduction, and has been imported from Germany and the Principalities. He attributes to the same source also, the dilution of spirits with water, and the sanding and damping of wheat and other cereals.

[TO BE CONTINUED.]

FROM a paragraph in the *Farmer* we learn that the Americans have adopted a new and peculiarly easy method of obtaining butter. A quantity of cream is wrapped in a thick linen sack, which is rolled in a large cloth and placed in a hole dug in the sand. Next morning a fine piece of butter is found, nearly every particle of milk having been absorbed. This is an extremely simple process; but, before trying it ourselves, we should be glad to learn the result of other experiments.

ACORNS.

Acorns for the purposes of feeding have recently received much attention throughout the press; but, if we consider the various processes to which they may be subjected, their value in reference to the food question will at once appear, although their unpleasant flavour precludes their becoming an article of general diet.

The most important purpose to which they may be applied is the manufacture of starch. Starch is at present principally made from rice, corn, or potatoes; but, if it can be procured from other materials, these will all be available for consumption, and must, therefore, be considered as so much food saved or gained.

The quantity of starch used in the United Kingdom alone, for laundry purposes, must be something considerable. If we assume a quarter of a pound as the minimum used for each one of our 30,000,000 inhabitants annually, this will amount to 7,500,000 lbs., which, at 5*d.* per lb., is worth 156,250*l.*

Potatoes contain about 10 per cent. of starch, so that ten times that quantity, nearly 75,000,000 lbs., must be used to produce it. This is so much food practically wasted. If this starch is sufficiently refined to be employed as arrowroot, as well as for laundry purposes, it may then become an useful article of diet; and, owing to the abundance and cheapness of acorns, it would be made much more easily than from any other source. Ripe acorns may generally be bought for less than 1*s.* per bushel; and the process of starch manufacture would be similar to that from corn or potatoes, namely, by grating, steeping, washing, straining, and drying in the usual way: the gallic acid may be neutralised, or extracted for other purposes, such as the manufacture of ink, of which it constitutes the principal element. I would also suggest the practicability of converting acorns into sugar or gum, either for domestic use or for distilling purposes. By this means a great saving would be effected, and the residue might be given to pigs, which are notoriously fond of acorns, and thrive well on them. Pheasants, domestic poultry, rabbits, etc., eat acorns greedily, when crushed up or ground; though it may be desirable to mix them with other meal until they are accustomed to this diet, being a strong medicinal astringent; hence, farmers are in the habit of giving acorns to calves when they require treatment, and this in preference to medicines of other kinds.

F. Wilkins.

THE WATER THAT WE DRINK.

Part II.

Water, as everybody knows, is a compound of two gases—oxygen and hydrogen. Nothing more than these are necessary to form it; and what is more, anything in addition, if present; must be regarded as extraneous matter. This may be proved in two ways—analytically, *i.e.*, by splitting the water up into these two gases, and synthetically, by uniting them, and forming water again. The one is a process of pulling down—the other of building up.

Then, it may be asked, does a glass of ordinary drinking water merely consist of these two gases chemically combined? Certainly not; and I pointed out the reason in my last article. Water has such vast solvent powers that, the moment it comes into contact with various gases and with the different strata and surfaces with which it meets in its course, it, as it were, licks them up and incorporates them into itself. Regarding, therefore, this solid matter from a purely chemical point of view, we must admit that it is an impurity—an adulteration—but an adulteration that nature has been pleased to bring about herself.

I say that this is our conclusion when regarded from a purely chemical view-point; but there are others from which we must observe it. He would indeed be a bad general who pitched his battle ground, and arranged his army, merely from the view presented to him from one spot of high ground; so he is a doubtful man of science who looks at a question of this nature merely as a chemist, without at the same time regarding its broader physiological and sanitary aspect. And now, admitting that everything present in water except oxygen and hydrogen must be regarded as "impurities," —still, when we find that these impurities have an important work to do, and an important part to play—when we find that the mere question of agreeable or disagreeable taste so largely depends upon them (for who would drink flat, mawkish rain or distilled water) —then, I say that sanitary and physiological science teaches us no longer to regard as impurities what are essential parts of this important beverage. I must here enter a protest against the use of the phrase "solid impurities," to express the solid matters present in water.

But to proceed. We take, say, a tenth of a gallon of water, and evaporate it to dryness. We find in the vessel in which we have evaporated it a certain amount of this solid matter, which no heat, however intense, can dissipate. The quantity varies immensely; but, taking our London water as an example, we shall find it amount to some 2 or 2·5 grains—that is, 20 or 25 grains in the gallon. These are the saline constituents; and, regarding them as a whole, we may divide them into two classes—first, *Alkaline Salts*, such as common salt or chloride of sodium; and secondly, salts of the *Alkaline Earths*, such as carbonate of magnesia, and carbonate, sulphate, and nitrate of lime.

Now there is one property of water that, generally speaking, attracts a great deal of attention, and it is not to be wondered at, for it is a very obvious property. This is hardness or softness. People have a great liking for soft water. Whether they are altogether right in their liking we shall consider afterwards. Not unfrequently a lodging-house keeper will recommend a special locality—in which, of course, she happens to have apartments to let—by assuring us that the water is "beautifully soft." It is a bait that often catches fish. We know a soft water by the ease with which we can wash in it, and the facility with which we can produce a lather. To what is the property of "hardness" due? Not to all the solid constituents of the water (common salt has no hardening effect), but to the second class of salts which I have specified, viz., the salts of the alkaline earths (as of lime and magnesia) present in the water. That this is the case is easy of proof. Make a solution of soap in dilute alcohol; pour a few drops into 2 oz. of distilled water, and note what a permanent lather is produced by the addition of the merest trace of the soap solution. Add to another sample of distilled water some common salt, chloride of potassium, or sulphate of soda, and you will find that you will still be able to produce a permanent lather, with almost the same quantity of soap solution which you had added previously. But now take another sample of distilled water; put in it a little carbonate of lime or magnesia, or sulphate of lime or nitrate of lime, or sulphate of magnesia, and note the large quantity of soap solution which you must add before you are enabled to produce a lather similar to what you obtained in the previous experiments.

It may be well to enquire for a moment here what happens when you wash in a hard water. You are first inclined to think that the water will not dissolve the soap—in ordinary parlance, "you can get nothing off it;" but this is not the case, the fact being that the water decomposes the soap. Pure soap is a stearate or palmitate of soda.

The stearic acid of the soap, in hard water, combines with the salts of lime and magnesia, forming stearate of lime and magnesia, which floats upon the top of the water in the form of a curdy, greasy-looking matter. With a soft water we have a lather produced, which is really nothing more than a solution of soap in the water. Its cleansing power is due to what is termed a detergency—that is, a power of rendering soluble in water the adhering dirt of the skin or clothes.

Now, in all analyses we state the hardness of the water. This determination is often a matter of very considerable importance. Some of these reasons I shall point out in my next paper; to one of them I may now refer. One of the most important domestic uses of water is to wash with; and for this purpose a soft water has vast advantages over a hard one. It is, of course, much less expensive (a matter of importance now-a-days), inasmuch as in a hard water a great deal of soap has to be destroyed, as I have already pointed out, before a lather can be produced. Then, a soft water saves a great deal of labour. To wash your hands in a hard water is no easy matter; and, lastly, with a hard water the pores of the skin become so stuffed up with the insoluble stearate of lime, that it is almost impossible, under such circumstances, to enjoy the luxury of a good wash.

Now, the hardness of water is expressed by degrees, each degree of hardness corresponding to 1 grain of carbonate of lime, or its equivalent in other salts, in a gallon of water; so that, when we say a water is 16 degrees of hardness, we mean that it contains 16 grains of carbonate of lime, or the equivalent in hardening effect of these 16 grains in other salts, in the gallon.

But there is a circumstance, to which I must refer, that at first sight seems somewhat extraordinary. Both the carbonates of lime and magnesia are remarkably insoluble in water; a gallon of water will not dissolve much more than 2 grains of carbonate of lime, and not so much carbonate of magnesia. How then are these salts held in solution by ordinary water? The cause of their ready solution is the presence of carbonic acid, which is one of the gases ordinarily present in normal water.

And this leads me to remark that the hardness of water is of two kinds—a hardness that is *permanent* and very difficult of removal, and a hardness that is *temporary* and easy of removal. The former is due to the sulphates, nitrates, and other salts of lime and magnesia; the latter to the carbonates of lime and magnesia. These latter, I have said, are held in solution by the presence of carbonic acid, which carbonic acid is driven off when the water is

boiled; and, consequently, the carbonates of lime and magnesia must in a great measure be thrown down at the same time. In this way (viz., by boiling the water) its hardness may be very often considerably lessened; but only that hardness, however, which we have called temporary. The boiling decomposes the bicarbonate of lime and deposits the carbonate. Every one knows that the vessel in which water is constantly boiled becomes covered with a white deposit, which incrustation is due to these precipitated salts, mixed with small quantities of the other mineral constituents of the water. Engineers, alas, know too well how often the safety of boilers is endangered by this hard deposit.

The deposition of anhydrous crystals of carbonate of lime from water is presented to us on a magnificent scale in the formation of the stalactites and stalagmites in the caverns of the limestone hills of Derbyshire. Here water charged with carbonate of lime and carbonic acid enters the cave; the carbonic acid gradually escapes, and the carbonate of lime builds itself up, year after year, in increasingly magnificent pillars of the crystallised salt.

And now the question arises, are the advantages of soft water as great in a sanitary and dietetic point of view as we find them to be in an economic? This much-disputed point we must reserve for consideration in another paper.

C. Meymott Tidy, M.B.

There is generally something picturesque in the manner in which our confrères on the other side of the channel describe the commonest things; and, if now and then they draw upon their imaginations for the facts, their mode of expression is their own. A journalist thus describes the vaults of the great *Halles Centrales*, or market, of Paris:—"The vaults extend under the pavilions of the market, just as an underground warehouse corresponds with the shop above; and in these vaults, lighted by 1,200 gas jets, a multitude of industrious workers pursue their daily avocations. They are:—The *compteurs d'œufs*, who count the eggs coming in and going out; the *mireurs*, who, with the aid of a candle, investigate the autonomy of each subject; the *préparateurs de fromages*, who teach the Chester to mellow, the Gruyère to weep, the bric to run, and prick the Roquefort: the *rongeurs d'os*, who build up their merchandise espalier-wise against the walls, and do a capital business: common bones sell for 5 francs the cwt., but choice bones are worth three times that sum; the *manipulateurs de beurre*, whose operations are indispensable for the preservation of that delicate article; the *plumeurs*, *tueurs* and *videurs* of poultry, who strangle sixty birds per hour, and strip one naked in five minutes or less; the *graveurs de pigeons*, who receive five sous for filling the crops of a dozen pigeons with grain from their own mouths." There is a poetry, of its kind, in everything.

THE HISTORY OF ENGLISH FOOD ECONOMY.

Part II.

There can be no question that, as far as husbandry in England was concerned, the consigning of so large a portion of those engaged to hopeless serfdom was calculated to inflict the heaviest injury. Theretofore, the meanest labourer might hope to become the tenant of a house and field; but a new caste had arisen, that of the farmers, from which the labourer was severed, because initiation into the farmer caste required large capital. The farmer caste, however, as it became richer, better appreciated school education.

Other circumstances lessened the damage to the country, though they only presented a compensation for the fearful evils which had thus arisen, and which afterwards exposed us to that enmity of classes which is not yet appeased. The state of affairs which we are describing was attended by this mischief,—that we became too prone to look at class interests, and to be satisfied with the prosperity of certain castes, rather than to look to individual well-being among the whole. This has particularly affected the food question, and has left us in our present unsatisfactory condition; notwithstanding that, by the abolition of restrictions on the trade in corn, and on the supply of other articles of food, we have mitigated the material privations of our general population.

The spirit of energy accompanying the war was attended with corresponding enterprise in our manufactures and foreign commerce; there were great prizes in the lotteries of contracts and speculations which brought in hosts to seek the premiums, though too often to draw the blanks. So far as agriculture was concerned, the consequence of the war was to give large adventitious bonuses to those interested in land; and thus agriculture could not fail, though its servants were paupers. Every farmer who held a lease had only to pay the old rents, while he was drawing high and artificial prices in the forced paper currency of Bank of England notes, and thereby reaping enormous profits; and, as these leases fell in, the landowners in their turn got unexampled rents on renewal. The ultimate result of this system on landowners, farmers, and people, is more familiar to us; but the point to be remembered is, that during a time of national trial agriculture was not in want of capital or encouragement. With rich farmers and rich landowners, luxury was attainable in every essential of a farm; and it was only restrained by the less advanced knowledge of the day.

Food crops and the weight of stock were increased during the war, and so far there was a larger supply of food; but the consumption of sugar and of imported food decreased. The great famines, particularly that of the beginning of the century, were heavily felt; and it was in connection with these that the government issued instructions, recommending care in the use of food. Newly-baked bread was discountenanced, as was all waste in the use of bread. The wealthy classes were particularly enjoined to set the example at their own tables and those of their servants; and the king, George the Third, was among the foremost to obey his own commandment. They were also urged to purchase rice and such other articles of food as their means demanded, so as not to compete with the people for the ordinary articles of their subsistence. The use of potatoes and other substitutes for grain was enforced, and this led to a greater growth and more popular consumption of potatoes. Notwithstanding all care, there was pressing want and great distress, and there were many, in London even, who collected nettles and herbs of the fields as vegetables.

During the war the system of canals and turnpike roads was carried out, as were also the tramways; but these did not render so much service to agriculture, which, however, profited from the improvement of parish roads. This improvement was consequent on the establishment of turnpike roads; for when a landowner had travelled from London or from a neighbouring town by a good turnpike road, he did not like to have his carriage and horses stopped or ruined by the quagmires of the parish. The farmers were also disposed to put the roads in order, as they could send their waggons and carts on to the turnpike roads. It was, however, long before improved transport told on the conveyance of the crops, or the bringing in of manures. The canals, and indeed the turnpike roads, rather helped the manufacturers than the farmers, and the tramways were used by the miners. The labours of the great Trevethick for establishing the locomotive on the railway and on the common road, were not sufficiently supported; nevertheless, a considerable improvement in transport took place. The mule and the packhorse were superseded by the waggon and the light cart, and the produce of the country was more favourably distributed. The greatest benefit, however, was in making the farmer more accessible. His horse had always carried him fairly across country, even by a horse path or track; but now he could get a winter drive to market. The town people were, besides, more readily brought to him by means of postchaises and stage coaches, to waken him up. Instead of day travelling at the rate of 40 miles, day and night travelling at

6 or 7 miles an hour wonderfully expanded the area of intercourse.

This is a point in connection with transport which has been little observed, but which has had a great influence on our agricultural improvement, as it has on all branches of industry. If 40 miles be taken as a day's journey for man or goods, then the area available will be that of a circle of 80 miles; but if the day's journey be raised to 150 miles, then the diameter of the circle is raised to 300 miles, and this sweeps a wide area. The law is the same as to cost, and with regard to some goods, cost operates more than time, though the latter is not an unimportant consideration in the conveyance to market of fish, milk, fruit, vegetables, and killed meat. If the rate of conveyance by a road be 8*d.* per ton per mile (though it is in many cases 1*s.*), then the number of miles at which a ton of goods can be carried for 1*l.* is 30; that is, goods can be moved to and from the circumference of a circle of which the diameter is 60 miles. If a railway or canal is introduced at 2*d.* per ton per mile, then the radius becomes 120 miles, and the diameter 240 miles. Produce which could only be sold 30 miles off, thus becomes saleable at the same cost at 120 miles.

We understand now that, so far as the telegraph is concerned, the United States and India are as near to the City of London, as Paddington or Hammersmith were 40 years ago; but what we do not so well understand is, that London is as near now to the farmers of Devonshire, Dorsetshire, Somersetshire, Gloucestershire, Worcestershire, Warwickshire, Northamptonshire, Lincolnshire and Norfolk, as forty years ago it was to Buckinghamshire, Hertfordshire, Essex, West Kent and Surrey; and the supplies of the larger and distant belt have been made as available as that of the narrow and near belt. It is needful to observe this, to understand why agriculture in England was less influenced by canals and turnpike roads than by railways.

Coming to the end of the great war and the beginning of the peace, we find that, nothwithstanding all the writings of political economists, nothing had been done systematically to provide for the national well-being. Everything was done from hand to mouth—fought step by step against all the opposition of conflicting local and individual interests. Although it was admitted with one tongue that the culture of the waste lands was altogether essential, yet there was no general law. The enclosure of each common was to be effected by the costly and doubtful process of a separate Bill in Parliament; and, as a matter of course, public interests, and particularly the interests of those least able to take care of themselves,

were not the best regarded. Although a Board of Trade and Plantations had been set up, there was no agricultural organisation. The private Society for the Encouragement of Arts, Manufactures, and Commerce was the only organisation which, from the scanty contributions of subscribers, professed to give a systematic attention to agriculture; and its small funds were claimed for all kinds of projects. What that old society has done, under such circumstances, is something wonderful; but what is still more wonderful is, that it did not impress the Government and the people, by its example, with the benefit of concentrated action carried out on a larger scale.

Although ship timber was a great necessary of the war, and the Government held several large forests, yet there was no Forest Department, and the most scandalous abuses were allowed to flourish; so that even now the forests are a disgrace to our administration.

The fisheries did receive some attention in the way of bounties, but it was rather the Scotch fisheries that had the possession of a separate grant, by means of which small harbours and fishing stations were formed. There was no provision in England, except by speculation, whereby the poor fisherman, plying his hazardous trade to bring in food to the country, could have shelter for his boat and his own life, and a landing place for his produce, unless nature had already provided it in a ready-made shape, or an earl, or the mistress of a king, or footman of a queen had received the grant of it. The abolition of bounties on corn and fisheries, used as a means of abolishing the abuses, became, unfortunately, a means of abolishing the responsibility of the state towards its citizens. In the end, we have got to a time when a Board of Trade tells us that it has nothing to do with the trade of the country. At the close of the war the Government had already reached the stage that, without abandoning the responsibility, it was really doing nothing for the material well-being of the population.

Such was our state half a century ago. Some persons complacently believed that everything was left to private enterprise, and that private enterprise was so far superior to national organisation that it was to supersede and prevent all common action on behalf of the public really interested, beyond the interest of the individual speculation. Perhaps the worst feature of this fallacy is, that it assumes that private enterprise was and is allowed free scope, which is not the truth; for private enterprise was interfered with by Parliament, the Government, the Corporations, the anomalous authorities exercising public functions and disclaiming public responsibilities, the representatives of constituted monopolies, the self-acting resis-

tance of practically organised interests—of the clergy, of the lawyers, of the landowners, of the brewers, of the publicans, of the millers, of the bakers, of the corn-porters, of the ticket-porters, of the body-searchers, of the undertakers, of the button makers, of the woollen shroud makers, of the sponging-house keepers, of the straw bail, of the pettyfoggers, of the Scotchmen, of the mob, of the fashionable world, of the respectable classes, of the dissenters, and indeed, of every form and shape of resistance which could be cultivated—beyond the power of individual energy and capital to cope with. Private enterprise has seldom had fair play in England; and what is called private enterprise is in some cases no more than a monopoly constituted by the State, as in the case of a railway company or a bank; public in its powers of action on the community, private in its operation for the individual profit of those concerned.

HYDE CLARKE.

[TO BE CONTINUED.]

SCLERODERMA VULGARE, AN ESCULENT FUNGUS.—I was somewhat surprised some time since, amongst a host of other enquiries respecting the qualities of particular fungi, to have *Scleroderma vulgare* submitted to me; and still more so, after my evil report of it, to find that it had been largely eaten and pronounced very good. It is only in the young state, of course, that any question could arise about it, for like its allied puff-balls, when old, it is filled with a mass of loathsome dust. I ought, however, to have recollected that its use as an article of food was no novelty, as under another and false name it has been largely employed at Paris instead of the Truffle of Perigord, to adulterate Perigord Pies, the quality of which were, in consequence, much deteriorated. Young specimens were given by the late Monsieur Desmazières in his "Plantes Cryptogames du Nord de la France," Fasc. xvi., 1836, as specimens of the white truffle, though the structure is totally different. It is found abundantly in the neighbourhood of Mons, where it frequently appears in the market, and is sent from Belgium, in great quantities, to Paris. Some pains are taken to guard it in the place of its growth, by covering it with earth until of sufficient size, against the ravages of animals, but especially of the magpies. The same thing clearly is figured by Corda, under the name of *Pompholyx sapidum*, who considers it superior to either the black or white truffle. I am not certain whether Dr. Bull, who is such an authority on the subject, has really tried its culinary properties; but in a letter recently received, he says, "I am afraid *Scleroderma vulgare*, though doubtless edible when young, like all the other puff-balls, will scarcely do to *recommend* as edible, since it is so small and not attractive by its colour, even when young, and very dangerous at an earlier stage." There seems always to be conflicting evidence about the quality of fungi, the truth probably being that the same species may be wholesome or the contrary, according to local or climatic condition, or from idiosyncratic peculiarities of constitution. *Sparagris crispa*, one of the largest and most beautiful of our fungi, has occurred lately in two or three localities; and I have myself had some dressed which came from Miss Broadwood, of Lyne, in Hampshire, which proved excellent. A single specimen, like *Lycoperdon giganteum*, is so large, that it would almost be sufficient for a Lord Mayor's feast.

M. J. BERKELEY.

FOOD SUPPLY IN NICARAGUA.

The food supply on which the agricultural and mining population of Nicaragua usually subsist was the subject of much observation by me in 1867 and 1868. It may be roughly divided into two categories:—1st, that which is indigenous to the country, and which is chiefly composed of native products; and, 2nd, that exported to Central America, and which forms one of the few methods by which the natives can become acquainted with the food of their white conquerors and civilisers. Dry beef, maize, and beans, are examples of the first category; liquors, preserves, and pickles, of the second. We will briefly consider a few instances from either division.

The mode of preparation of the native bread, or *tortilla*, does not differ from that used by all savage nations, who employ the maize as a substitute for bread. The corn, after the husk is removed by strong alkalies, is roughly crushed between two stones, which preserve the Aztec name *metlate* (from *metlatl*) to this day, even in districts like those of Jarja and Lovago, where there is no history or tradition of the spread of Aztec influences. The pulp prepared on this stone is baked on a flat iron plate, the result being something like that observed in a Scottish girdlecake, where the thickness of the *tortilla*, or cake, does not exceed half an inch. When fresh, the *tortilla* is not bad, and I have been able to support life on it for a long period. The majority of white men, however, regard the *tortilla* as food of the coarsest and most wretched description, and refuse to partake of it in any form. I have, however, lived long enough, even in England, to learn to thrive well on the food of the country, coarse, bad, and unpalatable though it may be. The maize contains ·80 of fatty matter against ·60 in oatmeal, and ·20 in fine wheaten flour; a fact which should lead one to recognise its great utility in maintaining digestive faculties in a state of equilibrium, without sinking either into the inertia which potato-feeding populations often possess, or the gastric derangement which is too often the results of over starch-feeding—whether the "Norfolk dumpling" or the porridge-pot is the vehicle by which disease and consequent death are conveyed. Low as the Nicaraguan savages have sunk in the

that the excellence of this chocolate is undisputed. The coffee is, however, far inferior to that from Costa Rica.

The pork, like the beef, has been an European introduction. The hog has run into a feral state in the woods, where he is termed *warri* (the males being named *javalis*, or *javalinos*), and although destitute of much fat, affords a nutritious kind of diet. The young medical man who wishes to thoroughly master the symptoms of cholera and diarrhœa in all their phases, may advantageously watch the condition of the Indian population, after one of their great feasts on under-done boiled fresh pork; and the pathological lesson may be of value. Mutton, it is hardly necessary to say, does not exist in these districts, though I have heard of a flock of sheep kept near Nueva Segovia.

The supply of food varies according to the time of year. During the wet season, which in Chontales lasts from September to March, much privation is often experienced by those who do not dwell in the immediate agricultural districts, as the thick coat of mud which then washes over every road, renders transport of any kind impracticable. Such luxuries as eggs, cheese, milk, butter (termed *mantequilla*, diminutive of *manteca*, literally "small lard"), must then be dispensed with. In the severe cholera season of December, 1867, much privation was undergone on this account by the residents in the hill country, which the advent of dry weather alone relieved. The cheese is very good on the whole, both the hard *queso*, which by reason of the quality of the milk advantageously compares with some of our English or Continental cheeses, and the small hand-made *quajados*, which in taste somewhat resemble the *Mainzerkäsen* of Germany. The butter, though imperfectly made, is far from being bad, and is superior to the butter that I have eaten north of the Tweed.

Poultry is a late introduction into the *cuisine* of the Nicaraguans. It is very plentiful, and a great object for Indians to steal. The duck is the so-called "Muscovy" species, derived from Brazil. I have never seen the ordinary duck in Nicaragua, though it is common in Cuba. The wild turkey, or *Pavon*, is a nutritious article of diet, which the sportsman can easily procure, as may also be said of the large red and yellow mácas (erroneously termed macáws), the smaller green parrots, and the monkeys (*Ateles geoffroyi* and *Cebus capucinus*). I am strongly of impression that all parrots are deceitful birds, *i.e.*, that they are so covered with feathers, that there is very little meat to form a succulent dish. I admire monkey, and cannot sympathise with those who are so fond of drawing the ideal comparison between the flesh of monkey and that of a young

child; never having tasted, at least to my knowledge, the flesh of young child, I cannot speak with precision, but should rather compare monkey meat with that of hare, adding to the delicately aromatic game flavour an amount of fat which the English meat does not possess.

The food imported into Nicaragua comes chiefly from New York, and wheat-flour is beginning slowly to supplant the maize of the aborigines. I must say a word about the pickles sent to Nicaragua. I have purchased pickles bearing the label of one of the most respectable English firms, and sent *vid* New York. On proving the bottles labelled as *piccalilli*, the contents were found to be merely chopped hay. I do not attribute to the English firm knowledge of this deceit, as it is possible that their labels may have been forged, or their empty bottles refilled; but it is precisely one of those examples which should lead purchasers to be very cautious, even where the name of a firm of undoubted respectability appears on the label of a bottle. The beer that I have drunk at Tierra Blanca never flowed from Burton-on-Trent, and to this day I believe that I am the only white person who ever really drank a whole glass of "port" wine purchased at that amusing little *rancho* near Masapa. Of the hideously smelling fluids labelled "Bourbon whisky," "Monongahela whisky," "genuine cognac," I have no experience, as the precept, "*Non ragionam di lor, ma guarda e passa*" governed my actions entirely. The diplomatic representative of United Italy, up to March, 1868, kept a little shop at Granada, where Garibaldian politics and excellent oil and pickled tunny were alike retailed. Although accident, or the chance shot of a near-sighted Irishman, cut off the supply of Italian produce, yet the quality of the provisions supplied will always be remembered with friendly recollection by the gastronomic travellers in *la bellissima Nicaragua*.

C. Carter Blake.

For the purpose of examining meat extract as to its value, Herr C. Reichardt proposes the following tests:—1. The constituents soluble in alcohol ought to be 60 per cent. according to Liebig; the alcohol to be 80 per cent. strong. 2. A good extract dried at 110° does not lose more than 16 per cent. 3. Ether ought not to extract any, or at least no remarkable particles of fatty matter. 4. Albumen is not supposed to be present; if at all, it must be found in the parts insoluble in water and alcohol, and in a coagulated state. 5. In a good extract there ought to be from 9·5 to 10 per cent. of nitrogen. 6. The ashes ought to make from 18 to 20 per cent.; in them ought to be found a good deal of potash, say 5·5 and even up to 9 per cent. of the weight of the extract, and 2·7 to 6 per cent. of phosphoric acid.

PUBLIC HEALTH.

Part IX.—Sanitary Supervision (Central).—Continued.

3. Home Office.—Passing from the Privy Council to the Home Office, with its several departments, we come to the coercive and executive authority in Public Health matters. The powers possessed by the old Board of Health of initiating inquiries, into an excessive death-rate for instance, were inherited, as we have seen, by the medical department of the Privy Council; and much moral pressure may thus be brought to bear on sluggish or recusant local authorities. Advice, remonstrance, exposure, are the weapons in the hands of the Privy Council, and they are seldom used without effect. Few vestries or town councils could survive the severe word-painting of Mr. Simon in his blue-books, or the inevitable exposure of their delinquencies in the public press; but if the local authority *should* prove deaf to remonstrance, the Home Office is appealed to, and all resistance effectually overcome by the strong arm of the law. The information thus given by the Privy Council to the Local Government Acts Department of the Home Office is valuable, but necessarily partial and incomplete. Much would be left unobserved and neglected in unfrequented parts of the country, and perhaps in thriving towns, were this the only channel through which the delinquencies of local bodies could be reported to the central executive authority. The local governing bodies themselves, therefore, and even individual ratepayers, are given an initiatory power by the Local Government Act of 1858, and by section 49 of the Sanitary Act, 1866, which, though vague in its wording, is of sufficient importance to be quoted here. "Where complaint is made to one of Her Majesty's principal Secretaries of State that a Sewer authority or Local Board of Health has made default in providing its district with sufficient sewers, or in the maintenance of existing sewers, or in providing its district with a supply of water in cases where danger arises to the health of the inhabitants from the insufficiency or unwholesomeness of the existing supply of water, and a proper supply can be got at a reasonable cost, or that a nuisance authority has made default in enforcing the provisions of the Nuisance Removal Acts, or that a Local Board has made default in enforcing the provisions of the Local Government Act; the said Secretary of State, if satisfied after due inquiry made by him that the authority has been guilty of the alleged default, shall make an order limiting a time for the performance of its duty in the matter of such complaint; and if such

duty is not performed by the time limited in the order, the said Secretary of State shall appoint some person to perform the same; and shall by order direct that the expenses of performing the same, together with a reasonable remuneration to the person appointed for superintending such performance, and amounting to a sum specified in the order, together with the cost of the proceedings, shall be paid by the authority in default." By this, our sanitary *Magna Charta*, a power of complaint is placed in the hands of all, and the Home Secretary is seldom appealed to in vain; but the fear of unpopularity, and the dread of being pointed at as busy-bodies by their fellows, exercise a potent spell, and tie tongues which are burning to tell of local mal-administration, and the utter disregard of the main conditions of health. The central office for the administration of the Local Government, Sanitary, and Sewage Utilisation Acts has, therefore, no initiative power, and its functions as a health authority begin only when an appeal has been made; but the necessity of appeal is not seldom suggested from head quarters, and the central authority may in such cases become the originator of important sanitary improvement and local change.

The Home Office undertakes the examination of drinking water, and gives advice generally under the Nuisance Removal Acts; not *ex officio*, for no central authority is named for their administration, but as a voluntary effort in aid of sanitary progress and reform. For the purposes of local inquiry and advice, three engineering inspectors are employed by the office; and as the same ground is often covered by the medical inspectors of the Privy Council, the possibility of a collision between these officers is only too evident. Terling is a case in point (see evidence of Mr. Tom Taylor, Royal Sanitary Commission). Fever had broken out, and the aid of the Privy Council was invoked; medical authority suggested cesspools as an appropriate remedy for the evils complained of; engineer authority thought differently, and the cesspools were countermanded by the Home Office as likely to do more harm than good. The duties and difficulties of the Home Office under section 49 of the Sanitary Act (quoted above), are feelingly described by Mr. Tom Taylor in his evidence, from which I have already quoted. He there instances towns which have persisted in a state of masterly inactivity for two or three years, in spite of all that the central authority could urge or say. The power to do the necessary works, and recoup itself by collecting the rates—a power which is held *in terrorem* over the heads of defaulting vestries—is rarely exercised by the Home Office, and Mr. Tom Taylor could recall but three instances in which a process so clumsy and inconvenient had been resorted to when all other means had failed.

The Home Office then, although not directly initiative, may have a wide-spread influence on the Public Health, through the controlling and coercive powers which it can bring to bear where an appeal has been made, either for its sanction to sanitary measures, or for its interference in cases of gross neglect.

Not only sewage and drainage matters, and water supply, but under the Sanitary Acts the power of registering and improving dwellings let as lodgings, of preventing overcrowding, and providing the necessaries for cleanliness and ventilation may (if it please the local magnates to apply for it, but not otherwise) be exercised and administered under the direction of the Home Secretary, and the office of the Local Government Acts. The Burial Acts fall to the care of another branch of the Home Office. Lastly, the office for the registration of births, deaths, and marriages (under the Home Office), which has been already considered in its ordinary working, must be briefly noticed here as a central adviser and commentator on matters relating to the health of the people.

Office of the Registrar-General.—The history of the department for registering births, deaths, and marriages, as contained in thirty-one annual reports, affords a notable example of the spirit which has animated the foremost among our Public Health Officers. No narrow interpretation of the letter of an Act is allowed in any way to cramp their efforts for the public good. It has already been pointed out that the additional labour, as well as the infinite gain, of a column in the register devoted to the "cause of death" was due to the energy of the Registrar-General and Dr. Farr, at the first passing of the Act in 1837; and the same self-sacrificing zeal which thus gave a sanitary bias to a political measure, has ever since been strikingly manifested in the reports which have come to us, year by year, from the General Register Office.

Without any strictly defined powers of supervision in Public Health matters, the Registrar-General has never ceased in his endeavours to bring the facts which come before him, either directly or incidentally, to bear upon local sanitary authorities. Local Registrars have been directed at all times to report on sickness prevailing in their districts, and especially on disease of an epidemic or infectious type. These are published in the Quarterly Returns, and a "black page" is reserved for towns with an unsatisfactory bill of health or an excessive death-rate; much has thus been done to drive or persuade local bodies into action.

Watering places are pitted against each other in a sanitary competition (Reports 19 and 27), the prize being a full season and a golden harvest. The losers may indeed complain, and with jus-

tice, that they are condemned on a quarter's average—that the fluctuations of a death-rate are not the sole, or even the surest, test of health; but the spirit which suggests the trial must command our respect, though opinions may differ as to the way in which it should be brought to bear.

Statistical information is freely placed at the service of Mr. Simon by the Registrar-General, and in his hands becomes the basis of specific or scientific enquiry.

The new Quarterly Return has already done good service in this direction, by giving prompter intimation of epidemics than was possible a year ago; and by showing, with a clearness which cannot be mistaken, the inestimable advantages which would attend quick, even though imperfect, returns of disease.

Among the higher and more scientific aims of the Registrar-General must be noticed the extensive series of meteorological observations, collected from fifty-three stations, under the direction of Mr. James Glaisher, and published with the returns,—an attempt to connect, where possible, the changes of season, temperature, etc., with the types, the fatality, and the tidal fluctuations of disease.

Hints on the causes and prevention of disease are freely scattered through the Reports, but it is in the remarks of Dr. Farr on the annual death-roll, that we discover some of the most valuable papers on Health questions that our medical literature possesses. Not to speak of his Life Tables, his Papers on Statistical Nosology or names of diseases in a classified order, his "Family Nomenclature in England" (Report 16)—a rich mine for those who are curious in the study of names; we find in the first and fourth Reports the possible bearings of mortuary records on practical medicine, sketched by a masterly hand; in the fifth Report, the influence of dense population on the death-rate is dwelt upon, and the seven necessaries of life form the text of a good lecture on Health; a series of questions respecting their districts is addressed to the Metropolitan Health Officers, and the answers only make us wish that the experiment had been repeated. The mortality of trades and professions is commented upon in Reports 14 and 15. Fevers find a place in Report 25. Such are a few only of the topics which will be found in the Annual Reports of the Registrar-General; but they suffice to show that the influence of the Central Office on the Health of the country, although indirect rather than authoritative or official, may nevertheless, be a reality; and, with the aid of the press, may be a growing power in the country capable of being used largely for evil or for good.

E. T. Wilson.

[TO BE CONTINUED.]

POPULAR FOOD ANALYSIS.

No. 9.—Some New Adulterations of Butter.

Since the first notice of butter in the "Food Journal" it has become quite the fashion to get up sensation paragraphs about the adulterations practised on that article of food. Several of these I have had the pleasure of exposing as nonsense; but samples have been placed in my hands by the Editor, showing such new and disgusting modes of sophistication, that it has been deemed advisable to give a special note upon the subject. These new adulterations are chiefly rag pulp and horse-bone oil. The former I have actually detected, and the latter, I am assured by "one who knows," is now much employed, although I have not yet met with it in detectable quantity. The rag pulp is a very ingenious adulteration, doubtless to give weight and consistency, and to retain moisture. In a sample purchased at Brixton by a subscriber to the Journal, and very properly forwarded to the Editor, this matter had been largely used. When tested for water by melting in a tube, and for salt by ignition, the butter gave very little appearance of either. After melting, however, a large clot separated, and although the sample was left all night in a cool place, it did not again solidify. This led to an immediate microscopic examination, which revealed the interesting appearances shown in the illustration, and proved beyond a doubt that rags in a state of pulp had been employed in large quantity. The rags themselves conjure up ideas sufficiently nauseous, but, in addition, *the dyes had not even been discharged*, as the filaments presented a great variety of magenta, blue, brown, and other colours.

While on this subject, it will not be out of place to mention a popular test for butter adulterated with tallow. The really exact mode of detecting tallow in butter can only be based on a proper separation and estimation of the various fatty acids. This is an operation which necessitates practice, and is also tedious. It is therefore useful to have some way of roughly ascertaining whether the butter be really contaminated, and worth the trouble of the more scientific operation. After many attempts and careful experiments, I am convinced that the following mode of procedure leaves little to be desired as a rough and rapid test:—Take a piece of butter as big as a horse-bean, and melt it at steam heat for about

The Field Journal.

BITES.

[illegible]

BUTTER,

ADULTERATED WITH RAG PULP.

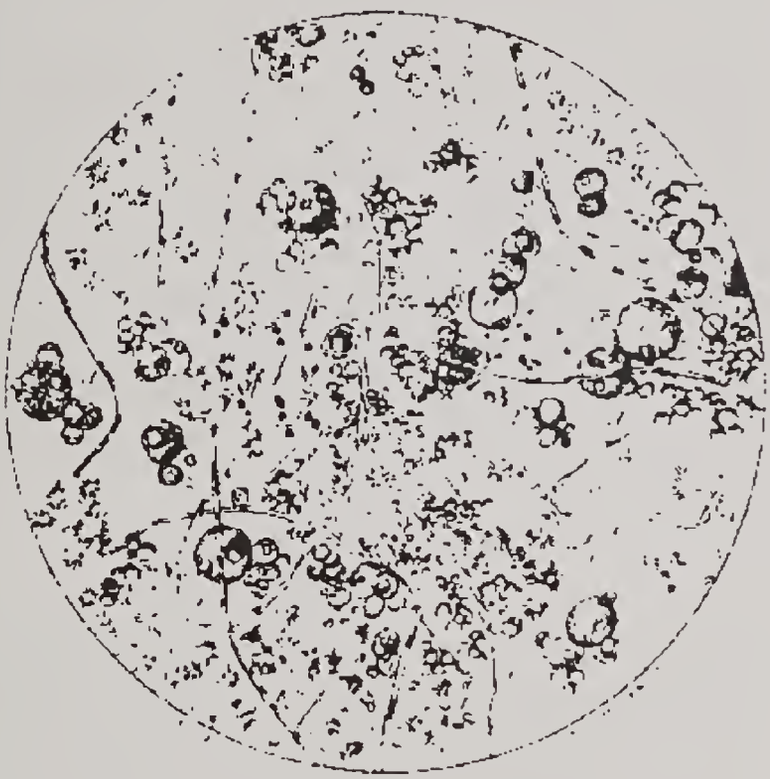

Fig. 14.

a. Globules of water and crystals of salt.

b. Butter.

c. Cotton filaments.

d. Linen fibres.

three minutes, in a little basin or watch glass; turn it out of the basin into a wine glass; *quickly* pour on 2 drachms of commercial nitric acid, containing nitrous acid, and give the glass a slight shake. Pure butter will immediately rise to the surface in small oily globules, which will not become opaque in five minutes. Tallow, on the other hand, will at once solidify to an opaque white mass, sometimes not rising even to the surface; while butter mixed with tallow will become partially opaque (according to the extent of the adulteration) in less than five minutes. Anyone trying this test on pure butter, pure tallow, and the same butter adulterated, will at once learn the appearance, and will be able to form a very shrewd opinion in future as to whether such sophistication has been practised. To give a rough test for horse-bone oil, which is not so solid as tallow, is more difficult; but if the butter be well shaken up with water hot enough to melt it, then allowed to rise to the top, and five drops of the fat so cleansed be tested in a watch glass with ten drops of strong sulphuric acid, a colouration will be produced when this oil has been used, much deeper than that given by pure butter. Want of space forbids any description of the mode adopted in separating and estimating the fatty acids; but we shall soon be able to recur to the subject, when a process will be detailed, which is found most workable, and which is a modification of Heintz's method.

No. 10.—WINE.

At once the best appreciated and the most abused beverage that we possess, wine demands our special attention at the present season. Christmas is fast approaching, and with it its juicy sirloin, its tender turkey, its indigestible pudding, and its social glass partaken of on that occasion by the members of most families, in even the poorest circles. On Christmas day, in the middle-class household, the usual family beer disappears, and the aristocratic wine takes its place, clothed in all the glory of the best decanters. But, after the day is over, then comes the reckoning, and whether justly or not, all the blame is laid on the unaccustomed beverage. Of course, nobody has taken too much of it; indeed, on the contrary, they may say they scarcely tasted it, but it was "too sweet," or it was "hard," or it was "ropy," or any other of the hundred and one dreadful faults which would-be connoisseurs have learned from the circular of the advertising wine firm from whom the fluid was purchased. Still, even when not indulged in to excess, the after-dinner grumbler may have perhaps good reason to blame the

tempting cup. Cheap wines have become a mania lately; and even the famous Captain Wrag of fiction, who sold splendid dinner sherry "pale to the eye and dry to the palate" at eighteen shillings a dozen, delivered free (bottles included) from the manufactory at Islington, is now equalled if not surpassed in every thoroughfare. In this as in other things, the universal demand for "cheapness" has been pandered to and taken advantage of by the advertisers, who vie with each other in the delicious, silky, delicate, and curious glass of wine which they offer for a price nearly equal to that of good bottled beer. It will be our object to see how far these beverages are curious in nature as well as in name; and in doing so we will follow our usual custom of first having a little gossip about the history and composition of wine.

Since the days when Noah was overcome by the fumes of the generous cup, through tasting the produce of his own vineyard, it has steadily increased in favour. Among the ruins of Thebes are to be found sculptures which illustrate all the processes of the vintage, thus showing that wine was used in Egypt at a period probably long antecedent to the Mosaic Exodus, after which its use was legalised among the Jews, provided that no admixture took place in its manufacture. The question has been raised by some, as to whether the fluid thus permitted by Divine legislation was really fermented and intoxicating; the arguments in favour of the non-alcoholic theory being supported by the fact, that in many sculptures, figures are shown in the act of expressing the juice from grapes into cups for immediate use. This view, although supported by a passage in the Pentateuch, is evidently erroneous, because we have it from early classical sources that the wine in use was strongly alcoholic. What school-boy who has spent years in miserable communion with antiquities and Lempriere does not remember the potent wine which required so large an addition of water, before it could be given by Ulysses to the Cyclops Polyphemus, to enable him to escape from that amiable personage? The ancient Greeks seemed to have produced, as a rule, sweet and thick beverages, those which came from Thasos and Lesbos being the most thought of. The earliest concise account of the method of wine making is that given by Mago in his wonderful book on husbandry, written in 28 volumes, about 540 B.C. This work, which was rescued by Scipio from the ruins of Carthage, and presented by him to the Senate, was much studied and followed by the Romans, who seem to have taken it as a text book on all matters of farming, in preference even to the writings of Cato. The manner of vintage, as here described, is almost identical with that still followed for

many liqueur wines, except that the product was heated and evaporated in a kiln called a fumarium, till it was frequently quite thick. The ancients had many curious tastes in the matter of wine, and added ingredients to improve its flavour at which our modern votaries of Bacchus would shudder—such as saffron, cinnamon, myrrh, pitch, rosin, and evaporated sea water. Looking to the latter ingredient, bibulous Romans must surely have been very thirsty souls; but, after all, they were perhaps no worse than our gouty old fogies of the present day, who stick so pertinaciously to the brandied solution of grapes and elderberries called port. The great point with Roman connoisseurs was to have old wine; and their thick compounds seem to have possessed keeping qualities in an eminent degree. The age of liquors was reckoned by leaves—each leaf representing one year. Thus, wine of fifty leaves was very good; and Horace makes a boast of having drunk wine "born with him;" while Pliny goes farther, and mentions some as thick as honey, and two hundred years old. But either our tastes have changed, or the modern Italian grapes have lost their flavour—for, as Henderson remarks, "The Falernum and Caccubum which inspired the muse of Horace, and warmed the heart of Cato, have disappeared from the soil; and the Rhæticum, which called forth the eulogy of Virgil, would now be sought for in vain in Veronese territory." To turn to our own country, we find that in the eighth century vines were grown in England, and laws made anent them. In the Acts of Alfred, cap. xxvi., we have the following: "*Si quis damnum intulerit alterius vineæ vel argo vel alicui ejus terræ, compenset siait ejus illud æstimet;*" and in the old Saxon writings, preserved in the British Museum, are to be found sketches of the whole process of the vintage. The monks of old, if tradition does not belie them, liked a social glass, and accordingly we find that nearly every monastery had its vineyard adjoining. There seems to have been special joviality in the diocese of Ely; because, in the records of the church there, we find the following account:—

Exitus vincti	£2	15	3½
Ditto vineæ	10	12	2½
10 bushels of grapes from the vineyard	0	7	6
7 dola musti, 12th Edward IV.	15	1	0
Wine sold for	1	12	0
Verjuice	1	7	0
For wine out of this vineyard	1	2	2
For verjuice from thence	0	16	0

None but verjuice made, 9th Edward IV.

It is to be supposed that the 9th Edward IV. was not a red-letter year in the monkish calendar at Ely. The culture of the vine in

England was greatly encouraged by the Normans, who doubtless were desirous of naturalising a beverage to which they were more accustomed than to the Saxon ale and mead. New plantations were accordingly made in the villages of Westminster, Chenstone, and Ware. In the twelfth century, according to William of Malmesbury, we find that wines were madè in Gloucestershire which equalled those of France; and in the Domesday Book is a remark that the domain of Thorny is "so fully cultivated, that no portion of the soil is left unoccupied. On the one hand it may be seen thickly studded with apple trees, and on the other covered with vines, which are trained on high, and supported on poles." Subsequently the vine was very successfully cultivated in the Isle of Wight, but a series of hard winters came which destroyed all the plants. Our ancestors seem to have not only imported a large variety of wines, but also to have been partial to certain mixtures which they made similar to our negus, but without the water. Thus, when Seville oranges were roasted and infused with sugar and Burgundy, the drink produced was called "Bishop;" when with old hock, "Cardinal;" and when with tokay, "Pope." The degrees of strength and expense rose with the dignity of the namesake.

The word wine really includes any intoxicating liquor prepared from the juice of a fruit by fermentation, but by general custom it is held only to mean the product of the juice of the grape. The kinds of wine, however, that may be produced from grapes are almost numberless, as the vine is a plant which has an immense variety of modifications. An idea of the large number of distinct kinds of grapes which are cultivated may be gathered from the fact, that in one garden near Paris there were lately 1,400 vines, producing each a different species of fruit, which had all been sent in from the surrounding wine districts of France alone. This variety of size, colour, and shape in grapes is caused by the circumstance that the vine is of all plants one of the most sensitive to the action of any external influence, such as light, heat, or soil. No rule can be therefore laid down as to the exact conditions of land most suitable for vines, because we are informed by M. Payen, that Champagne is generally produced in a calcareous, Burgundy in clayey, Medoc in a sandy, and La Gaude in a slatey soil. The vines of ancient Rome were evidently grown in a rugged and mountainous country, for we find that the operations of the vintage were considered so dangerous that Pliny states (B. xiv., c. i.) that "the grape gatherer in time of vintage putteth in a clause in the covenants of his bargain, when he is hired, that in case his foot should fail him and he break his neck, his master who sets him to work should give order

for his funeral fire and tomb, at his own proper cost and charge." An eminent chemist, writing on the subject of different species of vines, says that the like variety may be observed not only in grapes grown on the same spot, but even on the same vine. Protect a bunch of grapes from the sun by a covering of dark-coloured glass, and you will produce a fruit having a much finer aroma than the other clusters on the plant. The matter of manure for vines has also been a subject of deep study, and some curious points have been discovered by practical observers. It seems that, contrary to most plants, any putrid and badly smelling manures are not congenial to the vine, but that, instead of what is commonly understood as manure, substances which are slowly changed, such as wool refuse, should be employed in its cultivation. As to the most suitable mineral constituents of the manure, it has been asserted that the alkalies and phosphoric acid are specially wanted; but Mulder disputes this idea, and states that grapes do not require more than turnips, or even cereals. It would appear that the best manure is generally produced from the fallen leaves of the plant itself.

All grapes are very much alike in chemical constitution, and if deprived of their skins and stones would produce very similar wine of the pale class. The juice obtained from fruit thus treated contains glucose, or grape sugar, gum, tartaric and other similar acids, and a small portion of nitrogenous matter. If, however, the skins and stones be retained, as they usually are, we have at once a variety of tints and flavours, as the former contain the colouring matter along with nitrogenous substances, wax, and tannic acid, while the latter have the same acid with fatty and ethereal substances. The following is an analysis of ripe Austrian grapes, given by Fresenius:—

Grape sugar	13·80
Tartaric acid, etc.	1·12
Nitrogenous matter	·80
Gum, fat, etc.	·50
Mineral matter	·36
Total soluble portion	16·58
Water	79·80
Skins, stones, etc.	2·60
Pectose	·90
Insoluble mineral matter	·12
	100·00

It is therefore evident that, chemically considered, wine is a solution containing alcohol, colouring, and albumenous matter, and tartaric acid both free and combined; together with traces of citric,

malic, racemic, succinic, and acetic acids and their salts. In proceeding to detect adulteration in wines, the chemist has to face many difficulties; and not the least of these is to decide what really constitutes sophistication, seeing that many admixtures, such as an addition of sugar to the must, coupled by a dilution with water, are really recognised, and are indeed, in many cases, marked improvements on the natural juice. Then there is also Pasteur's system of artificially maturing wines by exposing them to a certain degree of heat, as well as the system of blending good with common articles so universally accepted in the trade, as to form no real adulteration, but simply a means of obtaining greater varieties of quality and price. Taking everything into consideration I have decided only to treat as adulterated those wines evidently manufactured from other bases than grapes, and sold as grape wine.

That this is extensively practised there can be no doubt, and especially in Germany. "Hamburg Sherry" has now become such a well-known bye-word, that every now and then we have the leading wine circulars congratulating the public on Messrs. So and So having just cleared so many thousand gallons of the stuff. This "Sherry" is quite a recognised article of commerce in the trade, and some of the advertisers even unblushingly sell it to the public under its own name, at the same time sweetening the bitterness of the cup by such delicious paragraphs as the following: "Hamburgh is a free port, where very fine spirit is to be had; and, as there is no duty payable, French and German wines are landed there and prepared after the Spanish model, the excise regulations and duties on spirits in France and Germany rendering such a process commercially imprudent in either of these respective countries." Truly the author of this should be worth his weight in gold to the firm who employs him. How beautifully the manufacture of this trash is described as "preparation after the Spanish model;" and how mildly are the penalties of such a fraud mentioned as "commercially imprudent;" and then what an air of genuiness there is about the whole. It says plainly, we are not guilty of any fraud, we tell candidly what the thing is, and we are therefore to be trusted that we do not sell the delicious beverage under any other name but its own; nor mix it with our higher wines.

Next month we will continue the subject, by the consideration of the best mode of detecting these manufactured wines and the publication of a series of analyses of cheap sherries, ports, etc., purchased in London.

J. Muter, Ph.D.

(to be continued.)

REPUTED QUARTS.

It was in June, 1824, that our standard measures were fixed by Act of Parliament. The old wine gallon, which contained 231 cubic inches, and the old ale gallon of 282 cubic inches, were abolished, giving place to the new imperial gallon, which was to contain 277·274 cubic inches. Without going into details concerning the temperature and other conditions of measurement, we may simply say that this standard gallon contains 70,000 grains of water, or 10 lbs. of 7,000 grains each; it also equals 4 quarts of 40 fluid ounces each, the ounce of water weighing 437½ grains. Leaving out of consideration the legislation in 1864 on the use of the metric system, we may conclude that the only measure authorised to be used in Great Britain and Ireland for the sale of wine, spirit, and beer is the imperial gallon, with its legal multiples and divisions. We propose in the present article to refer only to the capacity of those bottles which our wine merchants send to us under the name of quarts. Sometimes they are known as "reputed quarts;" but it is pretty generally understood now that they have not much of the quart about them, while their repute is very low.

Legally, a quart bottle should hold a quart; practically, it often holds not much more than a pint. A remarkably small bottle of delicious Hungarian wine first drew our attention to the subject. This wine, Somló by name, costs 48*s.* per dozen bottles—we were going to say quarts. Each bottle holds about 22 ounces—22 fluid ounces—just one pint and a tenth; one remarkably diminutive specimen had a capacity of only 21½ ounces. Some of these meagre measures do not reveal their capacity, or rather their incapacity, at once to the eye. They are of sturdy build in shape and substance, and, moreover, frequently possess what has been termed a dimple. One of these dimples holds 5½ ounces of water! and would, if cut out, make a small tumbler. Thus, the available capacity of the bottle is marvellously intruded upon by this inverted pouch of glass, and a vessel apparently containing 30 ounces is found to have room only for 23 or 24 *inside* it.

Forty fluid ounces are 2 imperial pints or 1 quart. Each ounce, if of water, weighs 437½ grains; 40 fluid ounces will weigh 17,500 grains, or 2½ lbs.; 4 quarts then, each of 2½ lbs., will make a gallon of 70,000 grains. We shall presently proceed to show how many reputed quarts (ought they not to be called "disreputable" quarts?) it requires to make a gallon. We give now a few measure-

ments of the capacity of certain bottles in which different wines were sent out by respectable houses, chiefly in London, during the years 1868, 1869, and 1870. The numbers represent fair averages, and are not taken from exceptionally small specimens. The first column in the following table gives the name of the wine or spirit; the second, the price; the third, the capacity of the bottle filled to within 1 inch of the mouth; and the fourth, the percentage deficiency.

Name of Wine.	Price per Dozen.	Capacity in Ounces.	Percentage Deficiency.
1.—Roussillon	20/-	28	30·0
2.—Neszmélyi	18/-	26¼	33·1
3.—Port	60/-	26½	33·8
4.—Barsac	24/-	26	35·0
5.—Sherry	48/-	26	35·0
6.—Ruszti	40/-	25	37·5
7.—Dry Tokay	42/-	23½	41·3
8.—Cognac	60/-	23	42·5
9.—Somló	48/-	22	45·0

Some interesting deductions may be drawn from the preceding numbers, and we direct attention to two of the most important of them. In the first place, it is usual for wine merchants, when a gallon or so of brandy or wine is specifically ordered, to count six reputed quarts to the gallon. Now, in the table just given it will be found that, though this allowance will give us pretty fair measure in five out of the nine examples which we have cited, in the other four the deficiency will be considerable, amounting in the case of No. 8—the Cognac brandy—to an amount which would only have been made up by reckoning seven bottles to the gallon.

The second point is this, that the advantages arising from the reduction in the duty of the lighter wines have been to a great extent nullified by the caprice and unfairness with which they are sold. The pure and sherry-like wine known as Dry Tokay nominally costs us 42*s*. the dozen—the dozen what? for the dozen imperial quarts really costs us no less than 70*s*. Those who can afford to buy wine in larger quantities can protect themselves; but there is no reason why small consumers should be debarred from the use of light unbrandied and wholesome beverages, because of high prices and uncertain measures.

Efforts have been made to remedy the evils of which we have spoken. Wine, beer, and spirits are sold by some vendors in bottles which really do hold a quart or a litre. We trust that before long, by means of some pressure (in addition to the protection afforded by the Merchandise Marks Act, 1862), we shall see the last of the "disreputable" quart.

A. H. Church, M.A.

FOOD SUPPLIES FROM THE ANIMAL KINGDOM.

Part III.

The herring fishery is one of the most important of our sea fisheries. Next to it is that of the cod; or, to describe it more accurately, the fishery of cod, ling, hake, and torsk; all of which (being of one family, *Gadidæ*), are captured by the same means of hand-line and long-line fishing—the torsk chiefly in more northern regions than the other kinds—and are brought to market in large quantities as stock-fish. Our herring fishery has so much increased since the beginning of the present century, as to yield about ten times the quantity of cured herring which it then did. The quantity sent to market, fresh or slightly cured, through the new facilities afforded by steamboats and railways must have increased in much greater degree. The cod fishery has likewise increased, and is steadily increasing in productiveness. Our statistics, however, in this case, as in that of the herring, are reliable only as to the Scottish coasts, and relate to cured fish. We are left to conjecture what increase there is of the numbers brought fresh to market. Of the haddock and whiting we have no statistics. These fish are all caught near the coast, and in comparatively shallow water; they are either used fresh, or slightly cured, in the form of Finnan haddocks, bervies, etc.

The herring family *(Clupeidæ)* contains, beside the herring, a number of valuable British species, as the pilchard, sprat, shad, and whitebait. To this family also belong many highly esteemed species found in other parts of the world, as the sardine and anchovy, of which the latter indeed is sometimes, though rarely, seen on our coasts. The capelin, extremely abundant on the coast of Newfoundland, and occasionally found in our shops, belongs to this family, as well as the candle-fish of the north-west coast of America, which is so excessively fat, that, in a dried state, it burns like a torch; the pilchard fishery of Britain is confined to a very small part of the coast, particularly the south coasts of Devonshire and Cornwall, the pilchard being an inhabitant chiefly of warmer seas; the produce, however, is not insignificant. The sprat fishery has not received the attention which it deserves. It has, indeed, been altogether condemned by some, on the supposition that the sprat is the young of the herring, an opinion now rejected by every naturalist, but to which some writers on the subject, evidently very

ignorant of natural history, pertinaciously cling. Sprats are extremely plentiful in winter on some parts of the coast. The produce of the sprat fishery of the Firth of Forth is said to be worth 50,000*l.* a year, although this fish is always sold at a very low price, and in Edinburgh and Glasgow, as in London, is chiefly consumed by the poorer classes, with whom it is a favourite luxury. The London market is supplied from the coasts of Kent and Essex, where such quantities are often captured as to be largely used for manure, a waste much to be regretted; for the sprat is really a delicious fish, and worthy to appear on any table. Indeed, the "sardines" imported from the west coast of France are generally mere sprats preserved in oil after the manner of the true sardines of the Mediterranean, and are not easily to be distinguished from them. The *kilkies* brought from the north of Europe are also sprats preserved in a different way. We might surely find means of preserving our own sprats, and availing ourselves more fully of the vast quantities which annually visit our coasts. The sprat is, however, a very local fish, and only abounds on certain parts of our coasts. In some years it is vastly more plentiful than in others.

We have already named all the important British species of the cod and haddock family *(Gadidæ)*, with the exception of the coal fish, which, however, we must not omit; for although it is seldom seen in our markets, and is not a fish of the finest quality, it is a staple article of food on the northern coasts of Scotland, and especially in the northern islands. The Shetlanders depend very much for their subsistence on the *sillocks*, or young coal-fish, which they catch with rod and line, from the rocks. This species is extremely abundant in these northern regions, but comparatively rare on the southern coasts of Britain.

Of all the tribes of fish the most important is that of flat-fish (*Pleuronectidæ*), including the turbot, halibut, plaice, flounder, etc. It is perhaps sufficient to name them; and, in like manner, to allude to a tribe somewhat similar in form, although very different in all essential characters, viz., the skates or rays. On some parts of the coast these were till lately thrown away as useless; as, indeed, we believe that in places distant from markets, they often still are. We have seen them rotting on the beach because no one regarded them as fit for food, a prejudice as ill-founded as that prevalent in Scotland against eels.

Our rivers, lakes, and ponds might certainly yield us fish in far greater quantity than they have ever yet done. Recent endeavours to increase the productiveness of our salmon rivers have been attended

with very encouraging success. But, in order to attain the object aimed at, it is in many cases of the first importance that an end should be put to the common practice of discharging into rivers the sewage of towns and the refuse of manufactories. There are other reasons which make this necessary—reasons much stronger than any that could be found in the possibility of an increased supply of salmon and other fish, desirable as that increase must be deemed. The fitness of a river for the life of fish may safely be taken as an indication of that condition of its waters which is salubrious for the human dwellers on its banks.

The natural productiveness of a lake or river may be increased by the use of proper means, almost as certainly as the natural productiveness of land. Into the consideration of these means we cannot at present enter, but the subject deserves to receive more of that public attention which it has begun to engage.

The crustaceans, notwithstanding their affinity to spiders—the thought of eating which has perhaps never been entertained by any of the human race—afford some of the greatest luxuries of our tables. It is enough to name the lobster, the crab, the crawfish, the prawn, and the shrimp. Numerous species of edible crustaceans receiving these names—although some that commonly receive the same name are distinct in character, but of different quality and value—are found in the seas of different parts of the world; and others, such as the crawfish, in fresh waters. One species of crawfish is found in many rivers of England, but is more abundant in France and other parts of the Continent of Europe.* In some parts of the world, as in the Southern States of North America, crawfish are extremely abundant, not only in lakes and rivers, but in every marsh and pond, or wherever the soil is very moist. The land-crabs of warm countries are also esteemed as good for food. Their abundance in some parts of the West Indies, and their periodical migrations, have often been dwelt upon by travellers and naturalists as worthy of special admiration. There are also many parts of India in which land-crabs, or fresh water crabs, are extremely numerous. It appears probable that *all* the crustaceans which we know by the name of crabs are wholesome and pleasant as food, although on our own coasts only certain species are ordinarily so used.

It only remains to notice the molluscs, or shell-fish, of our coasts, as contributing to our food supplies in a measure not inconsiderable, and which might easily be made far greater than it is. Oyster

* See the article on the *Écrevisse*, or crawfish, in our October number.

culture, as now practised on the west coast of France, and recently introduced into this country, seems to afford us the means of obtaining in abundance the most valuable and delicious of all shell-fish. Mussel culture, extensively prosecuted on some parts of the French coast, seems also well worthy of attention in an economical point of view. Mussels are not so good as oysters, but they are palatable to most people, and are used as food wherever they are found in sufficient abundance. Were stakes driven into the sand or mud, as is the French practice, on low shores on which the tide recedes a long way, we might have a multitude of mussel farms, yielding a great amount of produce, where now the coast is utterly unproductive; and, if it should be found, as some imagine, that the climate in most parts of Britain is too cold for profitable oyster culture, except within low-water mark, the space between high and low-water mark would thus be turned to the best possible account. It is only necessary to drive in the stakes, and to interlace them with a rude wicker-work of branches; the whole will soon be covered with mussels, as the spat is sure to be brought in sufficient quantity by the tide. On every part of our coast, mussels are soon found attached in thick clusters to any fixed object to which they can readily fasten themselves.

We have refrained from mentioning those articles of food which are not to be obtained in large quantity; although a very interesting topic presents itself, in our neglected articles of food, a better knowledge of which might be of use to many. It may seem to some readers almost ridiculous to allude to snails; but it is well known that a large species of snail, rare in Britain, and found only in the south of England, where it was probably introduced from the Continent, is a favourite delicacy in Italy, Austria, and other countries of Europe. The glass workers of Newcastle also have their snail-feast once a year, gathering the snails of the neighbourhood, which are certainly not of this species, but such as abound in all parts of Britain. It is strange that what is considered as a luxury by some should be derided or viewed with aversion by others. It would be hard, however, to say why periwinkles should be regarded as proper for food, as they are by most people in this country; while snails, which are very similar to them, are viewed with repugnance and aversion. There is no doubt that snails, whatever may be thought of them otherwise, are a very nutritious article of food, and this fact probably affords the explanation of the value which has long been popularly ascribed to them as curative of consumption.

J. Montgomery.

"A PENN'ORTH O' POT-HERBS."

"HERE'S your pot-herbs, a penny a lot!" Such is the announcement addressed, in stentorian tones, to the discerning public, by the proprietors of numerous stalls ranged on either side of Whitecross Street, St. Luke's.

My readers may probably not be acquainted with this locality. It is overshadowed by the vestiges of the old prison, but adorned by public baths and wash-houses for the labouring poor, and illumined by the "Tabernacle," in which are held meetings for the moral and intellectual improvement of the costermongers and their families, and in which hundreds of their children are daily taught how to tread the path of life here, so that it may lead to realms of love and light hereafter.

Some people call this a "low neighbourhood," but I do not. I recognise the principle that where there is an up-hill there must be a down-hill. Wherever there is a high light, there must be a deep shadow; and therefore, as surely as the Pyramids have reared their summits for ages above the ground, even so surely did the nummulites, of which their structure is formed, work for countless ages in the depths of the sea; and as certainly as the mighty-winged albatross sails high above the ocean at a thousand miles from shore, even as certainly does the humble earth-worm penetrate the ground deeper than man can reach, so enabling the rain from heaven to sink into and fertilise the soil. There is no occupation *low* so long as it is honest; and thus we realise the words of the poet—

> Let every work be hallowed
> That man performs for man;
> And have its share of honour,
> As part of one great plan.

Along the kerb on either side of this and the neighbouring streets are all sorts of arrangements for selling goods. These alone furnish, as it were, a complete record of the progress of shopkeeping; and, as the history of architecture has been called the history of the world, so in the gradual development of these stalls may be found the history of the growth of our magnificent shops, with their plate glass fronts reaching up to the second floor—even as it has been said, the hovel grew into the palace, and the cave became the temple.

Here is to be seen the most primitive form of stall—the supports being the legs of the proprietor, around whose neck an old tea-tray is slung. On this are sometimes displayed a few sheets of note paper and envelopes, a stick or two of very thin sealing wax, some pencils and pen-holders. Sometimes the edge of the tray is bent perpendicularly upwards, so as to form a wall; and in this case the article exposed for sale is a little pair of wheels made of wire; on the axle is fixed a small doll, which is wheeled along on this primitive bicycle by jerks on either side of the tray, to the infinite delight of the juvenile population, who look up to these toys as the realisation of all that money can purchase. Sometimes the tray graces the neck of a woman, and contains a few yards of edging or insertion, wound round a blue card; a cap or two of her own make; a kettle holder made of patchwork; a few yards of tape; a card of hooks and eyes; and a strip of pins;—the whole stock worth so little—yet by this alone must the poor creature maintain herself and children!

Next comes a tray, supported on a pair of slight trestles, usually the centre from which is distributed a composition for cleaning cloth, etc. The use of this requires a basin of water, and necessitates that the eloquent vendor should have the free use of his hands, so as to be able to prove the efficacy of his preparation by removing stains of paint, grease, etc., from the jackets of all "believers."

Now we have the costermonger's barrow, piled up with vegetables, of which an extraordinary supply may have turned up in Covent Garden in the morning—cabbages, cauliflowers, lettuces, etc. This is essentially a locomotive stall; the proprietor does not find it to his advantage to remain long on one spot, knowing that many of the women cannot come out to buy their vegetables, having work at home—shoebinding, machine working, and above all "the children" to look after. My informant told me that, rising at 3 a.m., he gets early to Covent Garden—buys cabbages, turnips, rhubarb, cauliflowers, or other vegetables, which he hawks during the morning; usually getting rid of his stock by about 12 o'clock. He then invests in cherries, apples, or such fruit as may be in season, which he sells during the afternoon; generally taking up his position (if the police allow him) somewhere near a school, just before 12 or 2, or from 4 to 5. In the evening he stocks his barrow with bloaters for supper, or oysters when in season.

Thus are the man's entire faculties, mental and physical, devoted to earning an honest subsistence, requiring as much watchfulness as to supply and demand, and the rise and fall in prices, as do

the merchant and stockbroker; for, said my hopeful "coster," "Mr. ——, and many others now in a large way of business, only begun as I did." He told me too, that several costermongers not only use their own donkeys, but have bought others with their savings, and let them out by the day.

These vegetable stalls may be said to keep up a certain amount of business all day and all the evening; for when the whole stock has not been sold before dinner, the remainder is disposed of as night approaches at lower prices; little heaps are made, consisting of a few turnips, carrots, leeks, onions, a small celery or part of one, a little parsley; and these are the "lots" forming the subject of the proclamation which is the keynote of this paper.

And now let us see the purpose which these "pot-herbs" serve in the preparation of food; and I hope to show that they not only contain in themselves a certain amount of nourishment, but that they increase the value of the small quantity of meat which the wife of a working man may be able to place on her family table.

Starting, then, from the most elementary point, we know that when we boil meat in water, albumen, and fat are boiled out of it.

Now, albumen is a flesh-former and force-producer; whilst the fat supplies the fuel which heats the internal oven in which our food is cooked, so as to be assimilated with the blood—the source of life and strength in our system.

Everybody knows that fat and water will not mix; but that, whilst the water is hot, the globules of fat are separated and held in suspension in it; and as the water cools they unite again, and form a cake at the top. This process goes on during the whole time that the soup or stew is being eaten, for as it cools, the fat is gradually separated, rising at last to the top; and unless the food is stirred up at every spoonful, the grease is taken first, and then, being lighter than the other components of the food, it rises again in the stomach (for, be it remembered, nature's laws *will not* be outraged), and does not undergo the process of assimilation simultaneously with the other portion. Enough heating matter is not sent into the system to assist in the process, whilst the grease remains floating on the surface of the food in the stomach, producing sickness, nausea, and disinclination to eat; and all experienced cooks know that if a sufficient quantity of coals be not supplied, the cooking process cannot be properly maintained.

Some careful mothers even skim off the coating of fat, and waste it, because they think that it makes people sick and bilious—not knowing that amongst the globules of which the fat consists are

many particles of nourishment, in removing which they are materially diminishing the value of the food that they are cooking for their families.

Again, let two persons sit down to a meal, and let the one eat roast beef *hot*, cutting away every morsel of fat, while the other partakes of *cold* beef, consuming all the clear good fat with which the old English fare is marbled and surrounded. In an hour after, the one who ate the cold beef and fat will be warm, whilst the other will be cold; but heat and cold in this case do not mean mere sensation; the first will derive greater *nourishment* from his meal, because the heat generated by the fat serves, as said before, to cook the food and thus digest it. It follows, therefore, as a rule, that we might just as well deprive our children of some of their external clothing, as take away that which generates inward warmth, and promotes the assimilation of the strengthening portions of food.

I think I hear mamma say, "Nurse, shall Johnny make mud-pies on the beach to-day with his top coat on?"—to which, by the way, Johnny much objects, as a pea-jacket seriously impedes his operations. Now, if the nurse had learnt "science" (though what that is in these days nobody knows), she would say, "No, ma'am, pack up the top coat, and buy a penn'orth of pot-herbs for the soup."

"Why, what on earth," says the educated lady to her ignorant servant, "has a pennyworth of pot-herbs to do with the matter?" Let us see.

Take a glass bottle, and partially fill it with warm water; add to this some melted fat,—gradually heat, and stir it. Whilst the water is hot the fat will seem to mix with it, but as it cools it will rise to the top and form a cake. Again apply heat, and this time add a teaspoonful of brown sugar,—stir it, and allow it to cool; behold, the cake of fat at the top will be just half its previous thickness. But follow up the experiment: apply heat a third time, add a teaspoonful of gum—allow it to cool—and you will find that the cake of fat will almost entirely disappear. Where has it gone to? The answer must necessarily be, that it has entirely mixed with the water.

Here then, is the secret of the use of the "penn'orth o' pot-herbs."

If we analyse 1 lb. of carrots, we shall find amongst the ingredients of which the vegetable is composed, 1 oz. 11 grains of sugar, and 70 grains of gum. In 1 lb. of turnips we shall find 280 grains of sugar, and 107 grains of gum. So that, we see, these two vegetables perform exactly the same office as the sugar and gum in the experiment, and thus utilise the fat in the food by causing it to

mix with the other ingredients, and so enabling us to take it without the disagreeable effects previously alluded to.

But this is not all; these pot-herbs (and I have selected these two as types of the class) not only serve as mediators, but bring in themselves a certain amount of capital into the concern; for we find in 1 lb. of carrots 42 grains of albumen, and in the same quantity of turnips 77 grains of albumen and casein. Further, in carrots we find 1 grain, and in turnips 35 grains of mineral matter; and the comparative importance of this will be recognised when we remember that in the body of a man weighing 154 lbs. there are 8 lbs. of mineral matter. But even this is not all; were every particle of the substances that we put into our stomach really digestible, the mass would become so closely pressed together that it could not be penetrated by the gastric or intestinal juice. Nature has guarded against this by giving us in our vegetable food a substance called "cellulose," or woody fibre. This forms the walls of the little bags in which the starch and sugar in the plant are packed up; it is this which, when the sugar has dried away or rotted, causes the vegetables to become what is called "stringy" or "woody." Of this woody fibre we find in carrots 231, and in turnips 168 grains per lb.

The limits of this paper preclude my pursuing the subject any further. I can only just mention the tastiness which these plants impart to food. Who does not know the exquisite flavour added by the simple sprig of parsley, or blade of celery? Who does not recognise the pungency of the onion (in itself a nutritious and most healthy vegetable) or of the chalot? And one word more—who does not look with wonder and admiration on the beautiful colours of the beet and carrot, and on the exquisite form of the leaves of the parsley and celery? And who is there that would say that a poor man would not enjoy his meal all the more, if the little piece of meat which has been boiled in his soup were served up nicely garnished with the gold and scarlet slices of carrot, the silvery wedges of turnip, and the emerald foliage of the celery and parsley? Thus to economy may be added beauty—beauty leads to refinement—and who shall say where refinement may lead? Need we, then, any more ask, what is the use of "A penn'orth o' pot-herbs?"

Ellis A. Davidson.

THE SANITARY CONDITION OF BIRMINGHAM.

Part II.

Not only is Birmingham in a difficulty with her sewage, but she is far from being well supplied with water. Comparatively low as is the rate of mortality, it would most probably be much lower were the water itself of a really wholesome standard. That it is not good, I shall easily be able to prove. There is only one Water Company in Birmingham, and it supplies an area containing about 460,000 people. Of this population the company does not supply more than one-half, if so many. Mr. Alderman Avery, who has persistently agitated the question of improved water service in the town, caused a house-to-house visitation to be made to 4,000 of the smaller class of houses. From the return given as to the proportion furnished by the waterworks, it would appear that considerably less than one-half of the whole population receive the company's water, the remainder depending upon surface wells for potable water. Dr. A. Hill, the borough analyst, gives the result of analyses, made in each month of 1869, of the company's supply:—

Date when sample was taken, 1869.	Total Solid Matter in Grains per Imp. Gal.	Volatile and Combustible Matter.	Chloride of Sodium.	Hardness.	
				Before boiling.	After boiling.
				Degs.	Degs.
Jan. 13th	19·04	3·08	2·45	11·5	10·9
Feb. 12th	20·02	3·36	2·35	13·4	10·4
March 12th ..	39·20	4·90	4·50	16·4	14·4
April 10th ..	26·60	2·80	3·83	14·4	10·4
May 11th	21·00	2·80	2·50	11·4	9·4
June 10th ..	45·36	3·92	6·33	24·0	15·4
*July 13th ..	42·56	7·56	5·44	17.8	12·4
Aug. 11th ..	41·16	1·40	12·34	17·6	14·2
Sept. 11th ..	46·48	4·48	7·05	21·8	13·4
Oct. 12th	32·34	2·52	4·38	19.6	13·4
Nov. 11th ..	18·20	1·40	2·45	15·4	8·9
Dec. 10th ..	18·20	2·80	2·29	11·4	6·4

* There was much suspended vegetable matter.

If we regard this table by the light of the standard fixed by the Brussels Congress of 1853, namely, that not more than 35 grains of solid matter per gallon ought to exist in any water used for drinking purposes, and that in no case should a greater proportion of

this than 1 grain be organic matter, we can hardly consider the company's supply a very desirable beverage. Nevertheless, it is a matter for very great regret that more of the people do not drink it, bad though it may be. My reason for making this statement will be seen from the following facts concerning the well-water drawn from the domestic pumps in this town. On the occasion of the visit of the British Association to Birmingham, Dr. Hill read a very able paper on the characteristics of the waters used in the town. The revelations then made as to the qualities of the shallow well-waters are such as to shock the feelings of any thoughtful man. The table is too long to quote in full, but a few facts from it will suffice. The total solid impurities per gallon figure in enormous amounts, such as 256, 380, and even 507 grains per gallon; while the organic contamination runs through a rising scale till it reaches the almost incredible figure of 48·16 grains per gallon, in the very water holding 507·92 grains of solid matter in each gallon! The water raised by the Waterworks Company from the deep wells from which they draw a great part of their supply is of a very excellent quality, yet the whole supply is inferior to that of most other large towns. The cause of this inferiority is the mixture with the pure supply, drawn from the deep wells, of a quantity of water drawn from the impure streams of a densely inhabited district. The subjoined table shows the amount of impurity per 100,000 parts of water, in the supply of eleven large towns, amongst which it will be seen that the Birmingham water ranks lowest of all in quality.

Impurities—parts per 100,000 *of Water*:

1.—Glasgow	3·00
2.—Lancaster	4·58
3.—Manchester	6·20
4.—Dublin	6·34
5.—Preston	12·44
6.—Edinburgh	12·69
7.—Newcastle-upon-Tyne	23·40
8.—London, New River	28·40
9.—Bristol	28·66
10.—London, Kent Company	42·00
11.—Birmingham	51·42

Not only does Birmingham come lowest in this list, but it figures as the only town of those named having a supply *inferior* to the lowest Brussels standard. Such being the state of the case, it seems scarcely credible that the Waterworks Company should deny the necessity of filtering their water, so far as it is derived from impure sources. They did do so, however, before the Parliamentary Committee a few months ago, and fought the Town Council for some

days on the point. It cannot be a good system which leaves the health of a great town so much at the mercy of a coterie of speculators, who sacrifice considerations of health to the percentage of a dividend. Sooner or later, there is no doubt that the Corporation of Birmingham must take the water supply into their own hands. At the present time the company claims to be supplying 8,000,000 gallons per day, but it is more likely that 6,000,000 gallons represent the actual quantity. For the supply of the district covered by the operations of the Birmingham Company not less than 15,000,000 gallons per day are now requisite, and the demand will rapidly rise.

The people in Birmingham are not so much crowded together as in most manufacturing towns; and the working classes are much better lodged than those of many other places. The possession of a separate dwelling by each family is almost universal; and, although there are slums in Birmingham as in other towns, the houses are mostly situated in moderately open streets or courts. As is the case in every locality, we find a great difference in the rates of mortality in different sub-divisions. In Birmingham there are twelve sub-divisions, which are separately returned as registration sub-districts; and in them the rate of mortality varies from an annual average (1851-60) of 14·9 in the well-to-do suburb of Edgbaston to 38·3 in All Saints. In the last-named district, however, are situated the workhouse and lunatic asylum, so that the return is thereby unduly swelled. Two other districts contain the two hospitals, and therefore become inadmissable for purposes of comparison. The district of St. Mary, however, offers a proper basis for drawing a line between the healthy and unhealthy parts of the town. In this district the rate of mortality is 28·2—nearly double that of Edgbaston. Before leaving this part of the subject it may be well to note that the rule as to births, as compared with mortality, holds good, inasmuch as the birth-rate is low in the healthiest parts, and high in the unhealthy; and, although the two rates are not proportional throughout, it is very noticeable that the most squalid sections of the population are the most prolific of children, in this way offering one of the most curious problems in vital statistics.

As a rule, the trades of Birmingham, which are vastly diversified, are not in themselves unhealthy. There are some, however, which are pre-eminently so; as, for instance, brass casting, particularly in the badly ventilated workshops, which are, unfortunately, but too prevalent in the district. Birmingham is emphatically a town of workshops rather than factories—of small masters rather than large capitalists. In many respects this is beneficial, enabling working men of careful habits to raise themselves to the status of employers; but

the picture has its dark side in the neglect—partly through ignorance, and partly through the smallness of the capital of the majority—of proper sanitary principles. Great numbers of workshops which are closely crowded were never built upon any principle whatever, being merely houses and other buildings gradually absorbed into expanding businesses. Lately, the Factory Acts have been extended to the Birmingham trades, and already a favourable impression has been made upon the larger centres of work; but, unfortunately, the Workshops Act remains a dead letter, having never been put in motion, and thus the very places where the greatest abuses exist are left without control.

Birmingham is unusually well supplied with all kinds of food—notably with fish of the best quality; and this, coupled with the generally good earnings of the people, has a considerable effect on the health of the town. The inhabitants of Birmingham have always been distinguished by their public spirit, and the great interest they take in national and local questions. Possessed also of an excellent daily and weekly press, in addition to an almost universal access to the chief metropolitan papers, they are distinctively a reading people. The town possesses a splendid free library, raised by means of a rate; and the effects certain to follow the general diffusion of a never-ending current of information are already making themselves visible. The Corporation have established public baths and wash-houses in three localities, to the great convenience of the population. The late Lord Calthorpe gave the use of land for a park at the Edgbaston side of the town, and the Rt. Hon. Sir C. B. Adderley, Bart., has allotted land on his estate for the same purpose. Some years back Aston Hall and Park were secured as a perpetual recreation ground for the town. The beautiful hall, and the undulating contour of the ground, make this park far superior to the others, which are little better than mere fields in appearance. In addition to the enjoyment of these three urban parks the inhabitants of Birmingham have the advantage of easy access, by rail and omnibus, to very salubrious localities around the town, particularly to the great expanse known as Sutton Park, which is one of the finest pieces of virgin land in the kingdom. A considerable number of the men of the town belong to the Volunteer corps, which is well maintained. A gymnasium has been started, which bids fair to become an important branch of the sanitary work going on.

The hospitals of Birmingham are distinguished for the completeness of their arrangements, the liberality with which they are supported, and the eminence of many of the physicians and

surgeons connected with them. A very admirable movement was commenced by the working men of the town some time back, and one which promises to bear important fruit in more ways than one. I allude to the organisation by the working men of a committee to collect funds amongst their own class for the addition of a new wing to the Queen's Hospital. A very powerful committee was formed, having representatives from all the chief manufactories in the town. Most wisely, this committee chose Professor Gamgee, the eminent surgeon, for their chairman. By so doing they secured able advice, and established a prestige for their praiseworthy undertaking, without in any way lessening the fundamental characteristic of the organisation as one of working men. It is pleasant to be able to record the satisfactory progress of the fund, which has already reached such proportions as to justify the immediate commencement of building operations. It is more than likely that one result of this excellent step will be the election of a quota of working men as a component part of the managing body of the Queen's Hospital. Such a peaceful revolution in an important social movement cannot fail to do good, in calling forth the best qualities of the men elected, and in generally elevating the working classes; besides breaking down those feelings of unworthy jealousy so liable to spring up between isolated classes of the community.

It would not be right to close a notice of the sanitary condition of Birmingham without a mention of the splendid foundation of the Grammar School of King Edward VI. The income of this school is upwards of 13,000*l.* per annum; and this is continually increasing by reason of the rapid rise in the value of the land which forms the estate. This large income enables the highest talent to be secured in the staff of masters; and a very large proportion of the middle classes is educated here free of cost to the parents. Such an endowment cannot fail in producing important results. By the passing of the Education Bill a very great expansion of school accommodation for the poor will shortly be effected, as the town is already moving actively in the matter. Altogether, the social and sanitary progress of the great midland metropolis is very promising. Already we see it ahead of our other large towns in its table of health; and the best wish we can offer is, that they may follow so vigorously as to come abreast of the "Hardware Village" in health; while all that we need wish for Birmingham is, that it may carry out to the full the motto on the town shield—"Forward."

J. Beverley Fenby, C.E.

RICE.

I. Its History.—The use of rice as a breadstuff is probably coeval with the human race. Like that of the other cereals it extends beyond the reach of record. Under the name of *orus* in Arabic, *orusa* in Greek, *oryza* in Latin, *riz* in French, *reis* in German, and *rice* in English,—it has been known to history for two or three thousand years, being mentioned by Theophrastus twenty-two hundred years ago, and by Horace, Pliny, and Celsus at a later date.

Its native place is probably the steaming river bottoms of India, whence it travelled eastward and northward to China and Japan, and westward to Egypt and to us. When it reached Egypt we know not; early enough, however, as many think, to give rise to that singular exhortation of the royal preacher of Israel, twenty-eight hundred years ago, in which, alluding probably to the mode of sowing rice on the swollen surface of the Nile, he says, "Cast thy bread upon the (face of the) waters: for thou shalt find it after many days."—Eccles. xi., 1.

After being introduced into Italy from Greece, as we learn by the form of the name, and being domesticated for centuries in all the southern countries of Europe, it was carried, in the year 1695, to the then infant colony of Carolina; where it was soon cultivated to such extent, and brought to so high a degree of perfection, that the rice raised upon the southern seaboard of the American colonies, now the United States, has been ever since known in Europe as Carolina rice.

As an article of food it surpasses in importance every other cereal in present use. Wheat may be more nutritious, rye more hardy, maize spread over a wider range of temperature—but rice feeds the greatest number of human mouths. Among the swarming millions of the tropics, and of China, it occupies the same place as wheat in the warmer parts of the temperate zone, and rye in the colder. It has been estimated that, if the human race were divided into families according to the predominant use of the several grains, the rice-eaters would occupy the first place in number; while wheat and maize would contend for the second, with a fair promise of victory to the maize; and the fourth place would be held by rye, oats, and barley. Indeed, besides being "the staff of life" in the most populous parts of the earth, it is now so extensively used among all the other grain-eaters of the race, that it is questionable whether a

greater amount of it is not consumed as a breadstuff than of all the other cereals combined.

II. Its Characteristics.—Among botanists it is known by its Latin name *Oryza*, of the class Hexandria, and order Digynia. There is but one species, though there are many varieties; for the wild rice, so called, of the North American ponds and lakes, is not a rice, but a reed—not an *oryza*, but a *sizania*.

Food chemists tell us that it contains "less of the nutritive principle than wheat." This, however, is in some measure compensated by the fact that of all the cereals it is the most compact—a merchantable bushel of maize, or Indian corn, being rated at 56 lbs., and wheat at 60 lbs., while rice, which rarely sells by bulk, and therefore has no established standard like the others, seldom weighs less than 65 lbs. to the bushel, and oftentimes more. Its compactness is shown also in its resistance to being crushed, having almost a gravel-like hardness; and also in the fact that skilful boiling will cause it to expand and double—perhaps treble—its former bulk.

But, however weighty in the scales, it is exceedingly light upon the stomach. In general wholesomeness, in delicacy of flavour, and in the variety of uses to which it is applicable, it is probably not surpassed by any other grain. To the strong stomach of the day labourer it is as well suited as the coarse bread of the Indian corn, rye, or oats; while for the delicate appetite of the invalid, or for the tender organs of the babe, it is a safe substitute for sago, arrowroot, tapioca, or cassava.

III. Its Varieties.—What is known in England as the Cargo rice is a Bengalese variety, having a reddish cast, and rather coarse looking. The unusual size and sweetness of the grain, however, cause it to be esteemed by the Hindoos above all other kinds.

The red rice oftentimes seen in American shipments, scattered among the white grains, is not a distinct variety, like that of the Bengalese, but is the result of careless cultivation. Seeds of the whitest kinds, allowed to fall into the earth at harvest, and to lie there all the winter, will mature the next year into red rice. Its presence is regarded as a blemish.

The small variety known as the Patna, and remarkable for the slenderness and whiteness of its grain, is no doubt the best known and most highly esteemed in Europe of all the eastern importations.

The Carolina rice, acknowledged to be the best in the world, is cultivated in its greatest perfection at Wacamaw, near Georgetown, South Carolina, and on the Savannah and Altamaha rivers; but can be produced in equal perfection along the tidewaters of the Floridas, as well as of Carolina and Georgia. Of the many sub-

varieties in favour with American rice planters, the two most highly prized are the white and the golden, so called from the colour of their chaff. Both kinds produce abundant crops, and turn out beautiful grains; but the white is preferred by some planters as being more prolific, and better suited to a highland or semi-highland culture; and the golden is preferred by others as better suited to tide-water culture, and as furnishing more pearly grain.

IV. Its Culture.—Were an opinion formed only after inspecting the larger and more costly rice fields of the regions just mentioned, it might be supposed that no one need attempt the culture of rice who had not at his command a princely fortune and a boundless supply of fresh water; with grounds as level as a floor, and rich as the bottoms of Egypt. But this would be a mistake. In small crops, sufficient for ordinary family use, rice is easily cultivated, and with little outlay of money or of labour. In every part of Carolina and Georgia, from the seaboard to the mountains, are to be seen, now and then, little patches of it, only a few rods in extent, belonging to farmers of small means, or to negroes of no means at all.

A note made years ago, and lying now before the writer's eye, says with much truth:—"*Rice.*—Few crops more easy; can be raised on any soil that can be made either wet or rich. Usual yield, from 30 to 60 bushels to the acre. Easy crop for poor man, lazy man, any man."

The great pre-requisite to its successful culture, on any scale, is a genial temperature. In large crops, another pre-requisite, for reasons to be given, is a level bottom, with back-water sufficient for repeated overflowings. On a small scale, however, and for a limited time, this repeated overflowing is not necessary. It is not unusual in the rice-growing States to see those little patches, mentioned a few sentences back, cultivated in the midst of a cotton field, where the black soil, indicative of a previously existing pond, is more favourable to rice than to cotton. In such cases the furrows of cotton stop at the edge of the black soil, and begin again as soon as it is overpassed. The cultivation of the rice, in the short pieces of furrow given up to it, is of course the same as the cotton, and that is the same as most other highland plants. It is but right, however, to say that, in such cases, the rice is substituted for cotton, not because it is a crop of more general value, but because on such soils the cotton produced will be of a blue cast, and of inferior quality.

All wet, spongy bottoms can be successfully used for a few years in the cultivation of rice; but after that time the soil is usually

overrun by a vigorous grass, which can only be subdued by an overflow of water.

It is mainly this last-named evil, the prevalence of interfering grasses, which makes the cultivation by water so imperative to the rice-planter. An overflow kills the grass, while it fertilises the soil, and more than doubles the yield. At the same time, the furrows being nearer together than is allowable for the passage of plough or hoe, the yield is by this means also increased, so that the product of wet culture is found to be very much greater than that of the dry.

In wet culture, the first care of the planter is to secure sufficient and reliable irrigation at proper seasons. This is accomplished by either of two modes. One is by damming the waters of a stream, so as to create a higher level than the field; the other is by reclaiming and dyking land, the surface of which is lower than the level of high-tide water, in fresh water rivers. It is an interesting fact in philosophy, and one of prime importance to the rice-planter, that sea water and fresh water are very reluctant to mingle. They may sometimes be seen flowing side by side for miles, distinctly marked by their several colours; and, what is still more important, the sea water, being the heavier, claims the bottom of the river as its right, and thus by its under-current lifts the fresh water to the surface, where it is needed for admission to the fields.

The next care of the planter is to have the ground reduced to so perfect a level that a small quantity of water shall evenly cover a large area.

His third care is about drainage. To effect this he must construct around and through his fields, a system of canals and ditches. The larger of these, varying in depth from five to ten feet, and in width from ten to thirty feet, and supplied at suitable points with water-tight trunks and gates, are intended for admitting the water to the fields, or drawing it off. From these large canals diverge others of perhaps half their dimensions, with a depth of from four to six feet, inclusive of the dam. And from these canals of second size proceeds a system of small ditches or drains, without banks, all over the field in parallel lines, about fifty feet apart, having a depth and width varying from 1½ to 3 feet.

On the levels thus prepared, the seed is sown in shallow drills, about fourteen inches apart, and covered with a wooden hoe. It is then buried under a thin stratum of water until it germinates, and afterwards treated by a system of rules which cannot now be given.

J. H. Lamprey.

[TO BE CONTINUED.]

DOMESTIC RECIPES.

The Editor desires to appeal to his readers, and especially to the ladies, for contributions of recipes for cheap, tasty, and serviceable dishes, both for poor households and those of the higher classes.

A GOOD OMELETTE.

Get 2 lbs. of fresh cream cheese, break it in small pieces into a stewpan, put it on the fire, and stir until it is melted; add 1 oz. of flour, and keep stirring until the butter begins to run from the cheese; then take it off; dish up, and serve with some sifted sugar over it.

THORNDON ANCHOVY PASTE.

Take the yolks of five hard-boiled eggs and 3 ozs. of butter; beat up in a mortar till quite smooth; then add a quarter of a teaspoonful of Cayenne and a tablespoonful of essence of anchovy.

MINCE PIES.

Take 3 lbs. of beef suet shred very fine, 3 lbs. of currants, ½ lb. of stoned raisins, 6 lbs. of russet apples, 6 ozs. of candy, citron and orange-peel; the juice of 2 large lemons and 1 orange; 1 lemon, grated; 1½ pints of rich white wine; 1 quartern of brandy; mace, clove, and nutmeg, to taste; and a little salt at pleasure. Mix, and press it in a large earthen pan. Cover it with paper, and keep it for use.

AN EXCELLENT TURKISH PILAU.

Chop up 1 lb. of good mutton, put it in a saucepan, with a ½ lb. of fresh butter; set it on the fire and let the meat stew a nice brown; add 1 lb. of the best rice (well washed), 2 pints of hot water, sufficient salt, and a pinch or two of cinnamon, and let it boil slowly till there is no liquor remaining; then take it off and place on the hob with the cover on it, for 20 or 30 minutes; dish it up in a dome shape, and serve hot.

A-LA-MODE BEEF.

Cut off the best piece of the buttock and lard it with bacon, seasoned with pepper, salt, and cloves; then put it in a pot with a pint of water; set it on the fire over night and let it stew, with some bay leaves, white pepper, and onions; turn it two or three times, and when done brown, add some butter, with two spoonfuls of vinegar; skim the fat, and pour the liquor over it as it goes on the table.

A GOOD RECIPE FOR GINGERBREAD.

Take 2 lbs. of fine flour, dried well by the fire, rub with it ½ lb. of butter, 1 oz. of carraway seeds, 1 oz. of ginger, ½ oz. of coriander seeds, and ½ lb. of fine sugar; mix them with 1¾ lbs. of treacle, and roll the mass as thin as a crown piece. A quick oven is the best.

NOTES OF THE MONTH.

It may at first sight seem uncharitable to advise the benevolently inclined to hold their hand from any further contribution to the Sick and Wounded Fund. But we do so nevertheless. The distress arising from the desolating horrors of war, terrible as it already is, is as nothing to the suffering that will be universal throughout the whole of France before the coming winter and spring are finished; and the nations of Europe will be taxed to the utmost to provide food for the famishing millions that will otherwise starve. Even supposing that critical season to have elapsed, whence is the next year's harvest to come? Even Germany, proud and victorious, will heavily feel the loss of her agriculturists, and she will find it no easy matter to feed herself; while France will have to be supported for many months to come.

The Milk Supply of London.—A crowded meeting of dairymen and others connected with the milk trade was held on the 24th of October, to discuss the present state of the business, and also the advisability of raising the price of milk from 4*d.* to 5*d.* per quart. The chair was taken by Mr. Disdall, who briefly stated that, owing to the increased cost of production consequent on the high price of hay and the short supply of roots and other food, it was impossible to continue to supply the public at the price now charged (4*d.* per quart) with a reasonable profit. After a long and stormy discussion a resolution was passed to the effect that the price of milk be temporarily raised to 5*d.* per quart.

Yankee Tea Making.—A medical man was lately consulted by a lady on account of discolouration of her teeth, which she supposed to be due to certain pills that he had prescribed for her. On investigation, the effect was traced to the tea used at her boarding-house, where the cheering beverage was kept from day to day in a tinned vessel, and heated up at meal-times, with the addition of a fresh quantity of the oriental herb. The tin had worn off in spots, leaving a surface of iron, on which the infusion, in cooling, acted chemically, forming a tannate or gallate of iron. The lady and her fellow-boarders had been regaling themselves on *ink*. It is said that this delectable way of making tea is not uncommon in boarding-houses and restaurants, and, indeed it is not a bad illustration of the general character of the Yankee *cuisine*.

A most interesting exposition of cooking was lately given at Messrs. Adams's kitchen range factory; the apparatus in use for the occasion being that of Captain Warren, whose name is now a household word in connection with army cooking, or indeed any kind in which portability and economy are required. Captain Warren's cottage and Abyssinian kitchen ranges deserve so much fuller a description than a passing note can give, that we hope very shortly to go thoroughly into the subject. It will suffice here to mention that the guests were supposed to be travellers under difficulties who were obliged to put up with the most simple fare, cooked in the speediest and cheapest manner. The *ménu* of the poor unfortunates was as follows:—Poor man's soup (2 lbs. meat to the gallon of water), turbot and lobster sauce, stewed eels, boiled leg of mutton, boiled fowls (afterwards browned). These were all cooked in the cottage range, which costs about 6*l.* to fit up. From the hospital range issued compressed vegetables and patent biscuit soup, roast mutton and potatoes, Irish stew, rice pudding, and omelette. The guests were critical, but the cooking was superb; and the party separated, fully convinced that the rich as well as the poor man's *cuisine* would be benefited by the application of Captain Warren's system and apparatus.

New York suffers as much from the evils of adulteration as we do in London. This kind of fraud is largely carried on in the article of sugar-candy, for mixture with which great quantities of kaoline, or porcelain clay, are annually sent from South Carolina. Fortunately, the imposition is easily detected, the sugar being soluble in water, while the clay remains undissolved. It is hard that the American youngsters cannot suck their lollipops without having their insides turned into a china shop. A still worse form of adulteration prevails in the article of cream of tartar (tartrate of potash), if indeed it can be called adulteration at all, when there is not a trace of cream of tartar to be found in the material sold under this name, which is composed of five-sixths of plaster of Paris and one-sixth of sulphuric acid and starch.

Amongst the food items of the month was a display of preserved cooked meats by Mr. R. Jones, which took place at one of the meetings of the medical Officers of Health. Mr. Jones's process is that of cooking in vacuo at a temperature of 280°, which, he asserts, prevents the contents of the tins becoming hard and stringy. The operation of the common oven is imitated; and by simple means the action of the fluids around the meat, which breaks down the fibre, is checked. Those which were laid upon the table were in fine condition, and cut easily; but the great objection to them as to others in the same category, was their utter want of flavour, so as to render it impossible for the taster to pronounce whether he was eating beef or mutton.

Messrs. J. Moir and Son, of Aberdeen, write to us that the article in the last number of the "Food Journal" on the provisions of Paris scarcely seemed to make sufficient mention of the immense quantities of salt beef and pork which were recently bought up in every market in Great Britain and Ireland at very high prices. Messrs. Moir themselves shipped from Aberdeen 2,000,000 lbs. of preserved boiled beef, and as much more of preserved mutton.

It is satisfactory to learn that packages of tea from China, sent by railway to New York and Chicago, have been delivered in excellent condition, no pulverisation or breaking of the leaf having been caused by railroad transportation; thus showing the groundlessness of the fears entertained on that score. In the half year ending June 30th, nearly 1,000,000 lbs. were transmitted eastwards by the Pacific Railroad. By this means of transport tea is delivered in New York in 12 days from the Chinese port. A rate will be charged of $4 per 100 lbs. gross weight, if 20,000 lbs. at a time be sent.

Mr. Tallerman, of Norton Folgate, has recommenced his experiments of penny dinners on a very much larger scale, having erected a steam cooking apparatus sufficient to provide for 10,000 persons at a time. He also proposes to send out hot penny dinners to factories and other places where large numbers are congregated, a system which, if properly managed, must prove a great convenience to a crowded and populous district. Mr. Tallerman commenced operations by a sample dinner, at which about 100 guests were present.

A Sheffield baker has been fined for selling aërated bread otherwise than by weight. The defence relied upon was, that the customer did not require the loaf to be weighed; also, that it came under the same definition as that species of fancy bread called a "Paris" loaf. The magistrates, however, saw it in the proper light, as an evasion of the Act, and very properly fined the baker.

In New York the adulteration of milk by water is so great that it is computed that the citizens are defrauded to the amount of $12,000 a day, or $4,000,000 annually. We should like to know how much Londoners lose in the same way.

NOTICES OF BOOKS.

"The Laboratory Guide." By A. H. Church, M.A., Professor of Chemistry in the Royal Agricultural College.—This useful little work has now reached its second edition, in which it has received considerable improvement and amplification. It is a book essentially fitted for giving to students of agricultural chemistry the amount of laboratory knowledge really necessary for them, without overloading their minds with processes in which they take but little interest. It opens with a series of experiments intended to illustrate the fundamental truths of chemistry; and not only are the directions full and to the point, but they are also judiciously chosen from matters affecting the class for whom the lessons are intended, such as the "manufacture of superphosphates," "lime in soils," etc. In the second part we have a manual of qualitative analysis, illustrated by tables of re-actions; and in the third part are given directions for doing such quantitative work as is required by farmers. This section also contains a few processes for the analysis of articles of food; and we consider them, as a whole, good and easily workable, although here and there we should be inclined to differ in the details. Taking the book in its entirety, however, we most heartily recommend it to all persons interested in agricultural chemistry, as a real and well-arranged *vade mecum*.

"Health and Longevity." By Lionel Beale, M.R.C.S.—If there is one point on which mankind in general would express an unanimous opinion, it would be the desire to attain a ripe old age. Were the question asked of each individua whether he would prefer to live long or die early, it is not difficult to guess which way the votes would run; but it is, nevertheless, a paradox that practically nine out of every ten people act as though their sole object was to ruin their health and shuffle off their mortal coil as soon as possible. Mr. Beale, in his handy and interesting little volume, "Health and Longevity," bears testimony to the fact that one-half of the population of England die before the age of 20; and points out to us the many ways in which we neglect the most simple precautions,—which in themselves go far towards constituting the true *elixir vitæ*. Cleanliness, "tubbing," food and raiment, exercise, facilities for healthful recreation in our large towns (almost universally ignored), bodily and mental overwork—the latter of which is one of the great curses of the day—the management and education of the very young, are all touched upon by Mr. Beale, with the clearness and earnestness of a writer whose heart is in his subject. The book ends with a very interesting table of examples of longevity, including the case of Thomas Damme, who died at Chester, aged 144, thus outliving Old Parr by two years.

BOOKS RECEIVED.

"The Natural History of Commerce." By J. Yeats, LL.D. Cassell, Petter and Galpin.

"Report on the Sanitary Condition of the Parish of St. George, Hanover Square." By C. J. Aldis, M.D.

"Report of the Association of Medical Officers of Health, 1869-70."

"Our Food." By Ellis A. Davidson. Cassell, Petter and Galpin.

"Edinburgh Medical Journal," for November.

[BY BALLOON POST.—Nov. 25.]

FOOD IN PARIS DURING THE SIEGE.

[This article, received from our Paris Correspondent after going to press, is given as supplementary to the present number.—Ed.]

The Germans are teaching the French a severe lesson in economy and dietetics. A great capital is a great spendthrift, and if it pays dearly for its enjoyment, others profit largely thereby. The idea that two millions of people, a large number of whom have ample means, should find themselves rationed like soldiers and paupers, is so novel that nothing but the actual experience of the fact can bring it directly home to the mind. That people who are accustomed to delicate eating, to every culinary luxury, who *fast* on delicious fish, the freshest of eggs and vegetables, water fowl and splendid fruit—say once a week—should now *feed* every day on an ounce or two of any kind of meat that they can obtain—beef, horse, etc.—is certainly an extraordinary form of sybaritism of the nineteenth century. But such is the fact; and the nearer circumstances arrive at a climax, the more deeply interesting in a scientific—though not in a practical—point of view does the case become.

My last communication, if it reached London, will have given some idea of our condition a month since. The end is certainly much nearer to us now!

Government had no alternative but to allowance our food, and the allowance is terribly small; while the fact offers the most convincing argument that all the regulations and goodwill in the world are but sorry substitutes for the natural course of trade and of free supply and demand. Our present position is another striking evidence of the truth of the saying that authority never, under ordinary circumstances, aids people so much as by letting them alone.

The system adopted of rationing out the meat in Paris may be described, theoretically, in a few words. The Government, by requisition, has taken all the "live meat" into its own hands, and made arrangements for its being retailed at fixed prices. The butchers could not, or would not, work under such a system, but many have given their assistance gratis, and consequently several markets or shops have been officially appointed for the sale of meat in

The almost impossibility of obtaining beef and mutton naturally forced the use of horse-meat upon the people, and, after a little hesitation, it has been most cheerfully accepted. Some persons prefer it to beef, from the gamey flavour which it possesses, and compare it to *chevreuil*—the small doe venison of France—which certainly scarcely deserves the name; others particularly dislike it for the same reason. This is, however, simply a matter of taste. As good wholesome food it has been universally eaten, and the soup made from it is declared by everyone to be superior to that from beef. Some people are quite enthusiastic on this head. A well-known artist states his opinion in the following terms:—"I have taken to horse," he says, "not only by taste, but also as a hygienic measure; every day the beef is worse and worse—the cattle want exercise and perhaps green-meat. As to horse, it is quite the contrary; we first ate the hacks, and now we have commenced on the truly fine animals. Good horse is undoubtedly better than middling beef, and it is a fact that, having become ill on beef diet, I have quite recovered on horse soup." A journalist, recounting this, takes the matter anything but kindly, and says that, though M. Morni has ceased to like beef, he need not disgust others.

A portion of the great central market is given up to the sale of horse-meat, and the demand has been so great that the fillet sold at 4fr. and even 5fr. the pound. But the flesh of the ass is better liked, and under the name of veal has sold for 4fr. the pound. As to the fillet and other very choice pieces they are worth any money, and can scarcely be obtained at all. Sausages made of horse-meat have been sold at the market at 9fr. the kilo.; and black pudding, made with the blood, at 7fr. the kilo. These outrageous prices have given rise to some disturbances. In one or two instances the people took the law into their own hands, pelted the dealers with their own goods, and made such an uproar that the gates had to be closed, and business suspended for the day.

Puff never foregoes his opportunities. A horse-butcher the other day exhibited the following placard:—"Horse of the first quality, from the stables of the Comte de Lagrange."

In order to put an end to speculation, the Government, some weeks since, taxed the rates at which horse-meat was to be sold; and the other day, finding that horse was sold as mule-meat, extended the tax to the flesh of mules and asses. The present rates for these are:—for the fillet, 3fr. thé kilo.; for the ordinary meat, best joints, 2fr. the kilo.; second class, 1fr. 50c.; and third class, 50c.

There has always been a joke in Paris on the disappearance of cats, and a common name for puss is "gutter rabbit," while a dead

cat is commonly called a "civet" *(civet de lievre)*, jugged hare. A caricaturist fixed this firmly in the public mind years ago. He sketched a *chiffonnier* and a *chiffonnière* in presence of a fine dead cat on a heap of rubbish. "After you with the *civet*," said the gentleman to the lady, politely lifting his hat. Like many other jokes, this one has come true; cat is eaten and sold openly, and although I never had the pleasure of partaking of a *civet* of the kind—to my knowledge—I can assure you that cats are relished by a good many people, and are quoted at 6fr. each, while dog is quoted at 4fr. the half animal. I have, however, doubts about the dog. One journal declares that more than 24,000 cats have been sold and eaten. A student in medicine sent the following note to a friend:—"Come on Saturday to my rooms and eat a broiled cat, seasoned with pistachio nuts, olives, girkins and pimento, and washed down with Chablis. After dinner we will drink some Rhenish wine to the indivisibility of France." At a good house the other day—the house of a *gourmet*—the bill of fare was: *filet de cheval rôti*, *escaloppes d'anon*, plum pudding, *au graisse de bœuf*.

Rats are talked of, and a journalist declares that there is a special rat butchery in a street which he names, but that they are not yet in great demand. No quotations.

Bread is at present plentiful and cheap, thanks to the stock on hand of flour and corn, and the regulations of the authorities. As to dairy produce, eggs are worth half a franc each, and very difficult to procure; cheese is quite unknown; milk is almost as rare; butter—fresh butter—is worth about 8*s*. a pound,—and a well known restaurant keeper paid 320fr. for 20 lbs. weeks since. The Government has been able, to some extent, to supply the place of butter in cooking, by means of carefully refined suet and fat; but the quantity is far below the demand, and the price high. The want of milk is a serious annoyance. Paris ordinarily consumes between 5,000,000 and 6,000,000 litres of milk per day; but since the investment there can scarcely have been a twentieth part of that quantity produced within the walls. The scarcity is well shown by the fact that the price of the small tins of preserved milk of the Anglo-Swiss Company are now worth, in the shops, more than 5fr. each; indeed a dealer asked me 5fr. 75c., and said that he had only three tins left.

Vegetables for a time were necessarily scarce and dear; but since the circle has been enlarged around us, by pushing back the enemy on three sides of the town, numbers of men and boys have been sent out to gather all that they could find, and the quantity must have been very large. These parties of *pourvoyeurs* are generally

protected by *éclaireurs*, and frequently the reserve of a sortie occupies itself in getting in vegetables; but the other day two parties of National Guards were sent out, and one of them had two or three men killed. The strict laws of Paris being considerably relaxed, a number of rather rough-looking personages have taken up their place on the pavements, and there retail what probably they did not grow or buy. Many marauders have been arrested and punished for collecting on their own account; but, while the demand is as brisk as it is, these men will pursue their vocation.

The following prices will have an interest:—Ham, 6*s.* 8*d.* per lb.; Lyons sausage, 12*s.*; a goose, 20*s.*; a fowl, 15*s.*; a pair of pigeons, 10*s.*; a turkey, 52*s.* 6*d.*; a rabbit, 15*s.*; a carp, 20*s.*; an eel, 15*s.*; a plate of gudgeons, 5*s.*; twelve eggs, 3*s.* 10*d.*; a cabbage, 15*d.*; a cauliflower, 20*d.*; a bunch of carrots, 2*s.*; a pound of haricots, 4*s.* The last wholesale dealing in eggs was a fortnight since, and the price 300fr. per thousand; they are worth nearly double that price now.

When we approach delicacies the prices are fabulous. Choice preserved meats are worth almost any money; veal and ham *pâtés*, 7fr. to 25fr.; *pâté de foies gras*, 45fr.; a turkey with forcemeat, 55fr.; and so on.

The restaurants are sadly at a loss how to make up a bill of fare for their customers, the rule being that no one can buy meat except at the butcheries in his own district. The *restaurateurs* are compelled to ask for their customers' "meat card;" but as this would involve the buying of meat at several different places, of course it is avoided as much as possible. The windows of the restaurants, and of the famous dealers in comestibles, are generally full of dainties, and attract the attention of all the passing *gourmets* and *gourmands*; at the present moment they attract equally from their poverty and their oddity. A pound of butter is almost regarded as an *objet d'art*; two or three fowls are quite a show, and half a dozen an extraordinary exhibition. In the window of one famous restaurant in the Palais Royal I saw a crowd contemplating half a dozen glass jars of preserved beef, a galantine made of beef instead of choice poultry, beef sausages, and a small plate of gudgeons!

The best *crémeries* make a grand show of clarified fat and cocoa butter, used commonly by perfumers only. The most fashionable pastrycooks show rabbit instead of chicken *pâtés*, and at double the ordinary price of the latter. To give an idea of the poverty of the supply, I may mention the *ménu* of an excellent restaurant where I dined the other day—an establishment of *recherché* character. Two simple soups; red herring with a sauce; Swedish sardines pickled, with a

terrible looking Russian name; roast beef; *chevreuil;* boiled ham and spinach; cold ham; no cheese of any kind. The prices were unchanged, only the portions were about one third the usual amount.

In the midst of all our annoyances we have our jokes. When dinner is ready some one is sure to say, "To horse, ladies and gentlemen; to horse!" Stories are told of commanders of besieged towns who presented to their guests as choice dishes a roast cat, garnished with a dozen of mice and a *salmi* of rats. The following is one of a dozen *vers-de-table*:—

"Manger du rat, du cheval, ou du chien,
Cela nous repose,
Quand on l'ignore, ce n'est rien;
Quand on le sait, c'est peu de chose."

A woman is detected stealing out of a house with something hidden under her shawl; she is arrested, and a fine cat found upon her. "Oh! pray do not expose me," she cries in a plaintive voice; "it is for a poor sick friend!"

The scarcity of provisions tells heavily on the poor, but the Government is doing all in its power in the way of assistance. It has placed considerable sums of money and supplies at the disposition of the twenty *Maires*, and has established a number of new economic kitchens, which distribute more than ten thousand portions of food daily. The first sum voted for this purpose amounted to 8,000*l.* Those who will take horse meat have double portions, and it is said that the consumption exceeds thirty-five tons per diem; but whether this is an exaggeration or not, I cannot tell. The extent of assistance given from these kitchens may be estimated from the fact that, at the low prices at which the food is sold, they cause a loss to the Government of 240*l.* a day. The expenses from this and other causes must be very heavy, and as there are now scarcely any receipts from the *octroi*, and those from the taxes are small, there must be a large deficit accruing. In the month of September, the income of the city was only 40,000*l.*, or about one-twentieth of the usual amount.

The question of diet has naturally attracted the attention of the various scientific bodies, and the Government has availed itself of the advice of several *savants*. One of these, Dr. Sée, gave a lecture on the subject at the School of Medicine, and the main points of his discourse have been printed and largely circulated. The Doctor tells the people of Paris that the daily diet of an adult may be made up as follows:—100 grammes of beef, 20 gr. of salt fish, 750 gr. of bread, 50 gr. of bacon, 50 gr. of vegetables,—in all,

970 gr. (2 lbs., less one ounce) of solid food, containing 88 gr. of albuminous matter; but, as a man loses every day 120 gr. of this substance, he requires in addition 32 gr. of auxiliary food. Cheese and butter not being attainable, we have coffee, chocolate, and wine to look to, the first and last of which have the remarkable property of causing a sensible diminution in the rate of progress of the phenomena of digestion, and of fixing a notable quantity of carbonic acid in our organs, thus maintaining the heat. Cocoa comes next in order after butter, and the Doctor expresses a wish that some manufacturer would give the world the benefit of pure chocolate at a fair price, as there are serious doubts about the quality of much that is in the market. Coffee has a warm advocate in Dr. Sée, who says that the French miners work for eight hours after a cup of coffee, in the morning alone, without experiencing any extraordinary fatigue, and that the fishermen on the coast find it of immense benefit. As to wine, it is the cordial *par excellence*, and when mixed with white or brown sugar it renders immense service. A man can live for a month, without any appreciable loss of force, on bread and wine alone. Against spirits, while admitting their value in moderate quantities, he is very severe. The abuse of these liquors, he says, is the best accomplice of Prussia; it is worth alone ten spies!

Unfortunately the scarcity of provisions is not the only difficulty that stands in the way of comfortable subsistence. Meat and other things require cooking, and although we were assured at the commencement of the siege that there would be abundance of coke, such is not the case; there is scarcely any to be had. An order booked at one of the gas-works was to have been executed in seventeen days, and when that time expired last week the answer was that there was none left. Coal is always dear in Paris, and is now unattainable; and the charcoal is exhausted. There remains only wood; of this there is yet a good supply, and the price has only been slightly raised; it is now 60fr. the ton. Wood makes a very good fire, but not for roasting in the ordinary way; and we were reminded of this the other day, when we were to regale ourselves upon horse beef, by our cook saying, "Madame, I have no coke left, so I have put the horse into the oven!"

G. W. Yapp.

THE

FOOD JOURNAL.

FOREIGN OFFICE REPORTS ON THE ADULTERATION OF FOOD, ETC.—PART V.

THE AZORES.—Consul the Hon. E. Monson states that in the city of Ponta Delgada, in the Island of St. Michael, the Municipal Chamber has passed from time to time such regulations and enactments as may be judged expedient for the protection of the public in all that relates to the sale and purchase of food. These laws comprise the following:—

1.—It is forbidden to expose for sale fish, meat, or any other comestibles, solid or liquid, when putrid, adulterated, or falsified, under penalty of $2, and seizure and destruction of the article in fault. (Ordinance of June 26, 1852.)

2.—It is forbidden to expose for sale bread which has been adulterated either with bad flour or with foreign substances, even though the latter be not prejudicial to health, under a penalty of $4 for the first offence and of double that sum for any subsequent transgression. (Ordinance of April 2, 1857.)

The Municipal Chamber is of opinion that these regulations are sufficient to meet the evil. They are enforced by the police, under the direction of the Chamber and of the *Administrador da Conselho*, who holds a position analogous to that of *Sous-Prefet* in France. Any breach of the law is rigorously punished, though it must be observed also that adulteration of the necessary articles of subsistence is a very rare offence, and that there is no sale for luxuries, either in the way of food or anything else, in the Islands of the Azores.

Wheaten bread in St. Michael's is generally of a bad colour, and sometimes has an unpleasant taste. This is attributed to the inefficiency of the bakers and to want of care in the selection and preservation of the flour. The Chamber is anxious to adopt measures for the amelioration of the wheat bread, but can suggest no remedy except the encouragement of more competent bakers,

whose improved bread would drive the inferior article out of the market. Bread made of maize, or Indian corn, is the staple food of the poor, and is generally pretty good. Indian corn meal is more easy of manipulation than wheat flour, and is of particularly good quality throughout the whole of the Azores.

In addition to these local regulations and ordinances the Penal Code of Portugal (Article 251) is applicable to all offences, such as adulteration of food or the exposing for sale of that which is unfit for human consumption.

In the neighbouring Island of FAYAL, according to Vice-Consul Dart, adulteration is almost unknown, though there exists a municipal law imposing a fine of $4 upon the owner of any store at which adulteration is found to be practised.

Vice-Consul Reade states that in the Island of TERCEIRA the regulations are based upon those established by the Board of Health, which are from time to time added to as occasion may require. The mixture of Indian corn flour in wheat bread, which is forbidden, is almost the only adulteration likely to be practised in articles of food, and this could not be done often, as the public would immediately bring it under the cognisance of the proper authorities. Infractions of the law are rare, but should a bad case occur, the offender is taken with the witness before the Administrador da Conselho, who determines whether the offence is punishable by fine or by the Penal Code of 1852. Should the offender refuse to pay the fine, the Administrador would draw up a process and remit it to the delegate of the Attorney-General, and the case would afterwards be decided by the Tribunal of Correctional Police. As the inhabitants of the Azores are very economical, fines are looked upon with considerable dislike, and are in general quite sufficient to put a stop to the evil of adulteration.

Mr. Consul Bonham states that in NAPLES the law numbered 2248 of the official collection of the laws and decrees of the Kingdom of Italy (dated Turin, 20th March, 1865) contains special enactments on the subject of adulteration. The enforcement of the enactment devolves on the Syndic, or municipal body, of each locality, which has considerable power in these matters.

The municipal regulations existing in Naples are these. In each quarter or district of the city (of which Naples contains twelve) there exists a Commission, including among its members two medical men whose duty it is to verify daily the quality of the food; and, if they find it defective or adulterated, to destroy it. Under this head come: 1. Unripe fruit. 2. Spoilt food, such as putrid meat, rotten cereals and vegetables, decaying fish, etc. 3. Food

adulterated with any other material, whether pernicious or not. 4. Infected food, as the flesh of animals that have died of disease. 5. Drinks adulterated with any article so as to give them a different taste or colour. 6. Impure drinks, such as waters of public cisterns deteriorated by the washings of heavy rains or the runnings of the gutters.

Poland.—Lieut.-Col. Mansfield, H.M. Consul-General at Warsaw, says that the attention of the police is specially directed to the subject of adulteration of food and drink. Delinquents, on suspicion or detection, are brought before a functionary of the police, acting in the towns under the municipal officers and in the rural districts under corresponding authorities.

Adulteration is much practised by the smaller traders, and indeed it is difficult to name any article, whether of home produce or imported, that does not come under this offence. When an analysis is required the article is sent to the Professor of Chemistry in the University of Warsaw for that purpose.

According to § 556 of the Penal Code, whosoever sells bread imperfectly baked is liable to a fine equal to the value of all the bread on the premises, the bread, moreover, being destroyed. For the second offence the fine is doubled, and there is an additional punishment of imprisonment for from seven days to three weeks.

§ 564.—Vendors of food who use in its preparation any articles which have been spoilt or are injurious to health are liable to a fine of from 50 copecks for the first offence to 2 roubles for the second, in addition to imprisonment of from three to seven days. For the third offence the imprisonment is extended to three weeks, with a prohibition against further trading.

§ 566.—Adulterators of wine by adding acetate of lead, small shot, or any other improper substance, are liable to a fine of from 10 to 200 roubles, an imprisonment of from three weeks to two months, or a forfeiture of privileges and a confinement in the House of Correction for from one to three years. The same fines and punishments are inflicted on all merchants and manufacturers who adulterate brandy, beer, porter, mead, or any other strong drink.

§ 567.—For adding any kind of improper articles to food, for negligent preparation of the same so as to be injurious to health, or for using vessels which are not properly tinned, offenders are liable to a fine of from 10 to 100 roubles and imprisonment from eight weeks to three months. For the second offence the punishment is increased by forfeiture of the right of ever again manufacturing the specified articles of food or drink.

§ 568.—The same punishments are inflicted on manufacturers of cooking utensils, or others in which food is prepared, of metals which are injurious to health.

§ 569.—If any death should ensue from the infringement of the above rules, the culprits will be liable to the additional punishment, if they are Christians, of undergoing Church penance awarded by their respective ecclesiastical authorities.

§ 670.—Persons trading in drinks which have turned sour, or who keep them in casks with copper taps, are liable to a fine of 1 rouble for each cask with forfeiture of the same.

In NORWAY, according to Consul-General Crowe, the Criminal Code provides that the punishment for adulterating food or drink by any extraneous ingredient is imprisonment with bread and water diet up to thirty days, or, with hard labour, up to three years. Should the ingredient be dangerous to health and life, the seller, knowing it to be so, is liable to imprisonment with hard labour for from six months to six years. Adulteration with any substance not injurious, such as that of milk with water, is punishable as a common fraud, viz., by imprisonment with bread and water up to thirty days or a fine. When cases of complaint occur a public prosecution is instituted, but they are extremely rare.

The report of Mr. Pierpoint Edwards, Acting-Consul at NEW YORK, states that the Act of the Legislature of the State of New York, passed April 5th, 1870, establishes what is known as the Sanitary Code, certain regulations of which apply to the adulteration of food and drink. They are as follows:—

"No doctor or druggist shall sell or prepare any medicine or admixture, any drug or decoction, under a deceptive or fraudulent name or pretence; nor shall any false representation be made as to the quality, purpose, or effect of any medicine or preparation of food.

"No distiller or brewer shall manufacture or offer for sale any liquid intended for the drink of human beings which shall be injurious to life or health.

"No person shall bring into the city or sell any unwholesome, watered, or adulterated milk, or that which is known as "swill," or milk from cows fed on garbage or that live in stalls; neither shall any cheese or butter made from such milk be allowed to be sold.

"Any person who offers for sale unwholesome milk incurs, under an Act of the Local Legislature, passed April 2nd, 1862, the penalty of a misdemeanour, and on conviction must pay a fine of not less than $50. The non-payment of this fine entails an imprisonment of not less than thirty days.

"Any person who keeps cows in an unhealthy situation, or who adulterates milk, shall be deemed guilty of a misdemeanour, and be liable to a fine of not less than $50; and if such fine be not paid, to imprisonment for thirty days.

"All vehicles and cans in which milk is exposed for sale shall be conspicuously marked with the name of the vendor and the place where the milk is obtained."

As a means of detecting adulteration or fraud in flour or meal, an Act of the Legislature, of April 29th, 1833, requires that every barrel or cask containing the same shall be marked with the name of the miller. The police, in conjunction with the officers of the Board of Health of the City of New York, are required by law to see that the foregoing provisions are complied with.

In the island of St. Thomas (West Indies), according to Acting-Consul Lamb, the minimum punishment for adulteration is ten days' imprisonment with bread and water diet, and the maximum is four years' hard labour, according to the law of April 4th, 1840, which, in point of fact, is the law against theft and other crimes affecting the rights of property. It runs as follows:—

"The punishment applies to anybody selling a false or adulterated article. When the offence is committed to any extent a more severe view of the case is taken. When goods are falsely provided with a stamp or mark known as that of a trader whose name should contribute custom and confidence (even if the goods are not of lower quality than they are represented to be by the false mark or stamp) the offender is amenable to punishment according to the extent of the business done and other attendant circumstances. When adulteration in goods or food has taken place to an extent that life or health is thereby prejudiced, the offender can even be punished more severely than by the maximum penalty specified. With regard to a smaller degree of adulteration or falsification, by which an immaterial loss only is sustained by the purchaser, an exception is made, so that the offender is only punished as though he committed fraud by using false weights and measures."

Consul Rainals, writing from Baltimore, states that no special provision is made against the evil of adulteration by any State enactment or city ordinance. The subject has not received the same attention which has been given to it in other cities, probably owing to the stringency of the inspections, which are made compulsory, of every article of consumption, and which, by the general power with which the inspectors are invested, appear to meet all the necessities of the case. The City Code, bearing date of September 14th, 1869, abounds in precautions and preventives in this matter, so as to render special enactments almost unnecessary. The support with which these regulations meet at the hands of officials, by seizure of bad meat, adulterated butter, lard, oil, meal, etc., bears ample testimony to their efficacy. As an inducement towards the discovery of fraud one half of the proceeds of sales and of fines is paid to the informant. This arrangement has been found very effective in bringing frauds to light, and the heavy fines imposed deter dealers from offering adulterated articles for sale.

THE CHEESE FACTORY SYSTEM.

Of the many articles of our accustomed diet which are gradually feeling the effects of increased scientific knowledge, none is undergoing such a revolution as the manufacture of cheese, which for ages past has been looked upon as a peculiarly British institution. From the labourer and the skilled operative to the greatest *bon-vivant* in the land, cheese is more or less essential to our daily meal; and in whatever light we regard it, either as an article of trade or as a food, we cannot overrate the importance of the part which it plays in our social economy.

Certain of our agricultural counties have been for centuries identified with cheese making, and, like Cheshire, almost stand or fall by the success or non-success of the year in their dairy yield. And although this particular branch of dairy work is only one of the many ramifications of the farmer's occupation, it is in some localities the one to which all others are made subordinate. It is curious, indeed, how the manufacture of certain kinds of cheese has taken root in some parts of England, which, partly from a conjunction of circumstances and partly from long habit, turn out a peculiar variety not to be found in any other county. For instance, Derbyshire, Cheshire, Gloucestershire, and Somersetshire are as famous for their different brands of cheese as Lancashire is for its cotton or Staffordshire for its iron; and popular taste would repudiate any or either of these kinds if there was any ground for suspicion that they were not made in their respective localities. But as I am not about to write a history of English cheese (interesting as such a subject would be), I will now only call attention to certain changes which are very materially affecting the cheese manufacture, and which seem likely ere long to revolutionise it altogether. "What everybody says must be true," and I think that I am within bounds in stating that there is a general feeling that cheese is neither so good nor so cheap as it used to be. The rise in price we can easily understand, since all farming produce has risen considerably of late years; and if grazing stock is high priced, and the rents of land have increased, milk, butter, and cheese will also be dearer. But there seems no reason why cheese should not be as good as formerly, though all housekeepers com-

plain of its deterioration. A scarcity of grass from long drought or an epidemic of rinderpest will, of course, be sufficient reasons, but only exceptional ones, and it is to be hoped that they will recur very seldom. But be this how it may, cheese buyers on a large scale declare that there is a considerable want of uniformity in the quality of English cheeses, no two of which can be depended upon to be equally good; whereas the case is different in America—so different, indeed, that the practical result of the last few years has been to largely increase the demand for American cheese in this country. This is not to be wondered at when we find that this cheese, which was formerly so strong and biting that it almost passed into a proverb, is now nearly equal to the best Cheshire. It has consequently largely displaced English cheese in the market, and even in counties like Derbyshire, which is so famous for this industry, the sale is said to be of the proportion of thirty of American to one of English.

The cheese factory system, to which this great improvement is ascribed, has completely taken root in America, and has latterly been introduced in a slight degree into England. The commencement of the system in the States and Canada has resulted in the establishment of over 1,000 factories, and the yield is above 220,000,000 lbs. in the course of a year, whereas that from England and Scotland is not over 180,000,000 lbs. In the State of Illinois there were, according to the last returns, 111 factories working up the produce of 33,631 cows, and turning out cheese to the amount of 15,999,700 lbs., of the value of $2,248,217. The total capital invested in these factories is said to be $1,679,000. One result of this, according to the *Albany Country Gentleman*, is that up to July 12, 1870, 104,000 boxes of cheese were sent to Liverpool in excess of those shipped in the corresponding portion of the previous year. The first establishment of a cheese factory in America has certainly the merit of simplicity and cheapness, the cost of such a building seldom exceeding 500*l.*, and consisting sometimes of only two rooms, one downstairs for making the cheese and one upstairs for storing it. The two most essential requisites appear to be good, wholesome pastures in the neighbourhood and a running stream of clear water. Given these necessary points, great cleanliness, a certain amount of plant (though very trifling), and careful watching, and the science of cheesemaking may be reduced to rule, and a thoroughly good article turned out with the utmost accuracy. Nothing is left to chance and but little to skill, so that if only good sweet milk is put in at one end of the factory, cheese worth so much a cwt. (about 62*s.* on the spot)

will certainly come out at the other. The balance sheet of one of these factories, as detailed by Mr. Crompton at a meeting of Derbyshire farmers, showed that it commenced work on the 30th of March and closed on the 16th of November, thus being in operation 231 days, and that during that time 1,310,540 lbs. of milk were used and 246,831 lbs. of cheese turned out. When sold this cheese realised 7,870*l.*, and the total profits of the year were 6,772*l.*, which was divided amongst the shareholders in proportion to the number of the pounds of milk contributed; for it must be remembered that, in some cases, the shareholders in these American concerns are interested not only in erecting the building and plant, but in contributing towards the daily working expenses in the shape of milk. There is, of course, no occasion for this banding together of interests, for one speculator may build the factory and contract with the farmers in the neighbourhood for the milk supply, which perhaps, after all, is the soundest way of doing business.

There are many very good reasons for encouraging this system in England, such as raising the standard of uniformity in the cheese; increase in the value of the milk, and consequently improved value of land; the employment of a larger amount of skilled labour in the factories instead of desultory and uncertain labour at home; and last, but not least, a steady outlet for the farmer's produce, which can always be disposed of at a better rate when placed on a systematic mercantile footing. A factory has been started during the past year at Longford in Derbyshire to work the produce of 500 cows, and one on a smaller scale near Tattenhall in Cheshire, and though there are many difficulties to be mastered and prejudices to be overcome (in which respect America has the advantage over us), there is not the least reason why the system should not be as successful here as there, and become a permanent addition to our agricultural industrial processes.

PHILLIPS BEVAN.

ADULTERATION OF RICE FLOUR.—According to A. D. Van Bastelaer, properly prepared macerations of all kinds of flour (wheat, rye, barley, Indian corn, oats, buck-wheat, peas, and linseed, with the sole exception of rice,) give precipitates with a saturated solution of picric acid. The maceration ought not to extend beyond an hour, and the reagent ought to be applied in large quantities. The reaction seems to be caused by the influence of picric acid on the proteine substances contained in the grain and pulse, and only in small quantities in the rice. In testing, 20 grm. of the flour, free of bran, are treated with 100 grm. of cold water. The mixture is stirred at 11° to 12° Cent., and then quickly filtered. The addition of an equal quantity of picric acid will enable the experimenter to detect as little as 2 per cent. of adulteration with grain flour.

OBSERVATIONS ON THE BOTTLING OF WINES.*

WINES are generally sold by the growers "in the wood," and dealers, in the majority of cases, export them in the same condition. Nevertheless, it is undeniable that a producer who can keep his wine under his own eye until it is ready for the consumer, or until it is sufficiently advanced for bottling, and who can perform the latter operation economically, will have, combined with other advantages, the assurance that his produce has not been tampered with in the interim; and we know that the makers of the finest wines have long recognised the expediency of selling them in bottle under their own brand. These considerations have induced me to offer a few observations upon the subject.

Bottling can never be regarded as an unimportant matter, seeing that upon the process depend in a great measure many of the best qualities of different wines. As a general rule fine and delicate wines never attain to their full perfection until they have been some time in bottle. There are many conditions essential to a satisfactory performance of the operation, such as the state of the wine, the atmosphere, and the materials employed in the process.

The state of the wine should be such as would prevent any further advantages accruing from its retention in the wood. This point varies much even in the same wine, that is to say, in wine made from the same plants grown upon the same ground, but of different crops (because the grapes of one year's crop may be more matured than those of another), and even in the same crop when the wine has been placed in different utensils and subjected to slight changes of temperature. To ascertain this point the palate of a skilled "taster" is generally the surest guide. Wine should never be bottled until it is still, clear, and translucent. The least negligence in these respects may seriously compromise its condition after bottling.

From what has just been said it will be seen that it is impossible to fix a determinate date at which any particular wine ought to be bottled. In any case it should not be delayed until the wine

* Translated by H. M. Chichester from the Portuguese, "Tratado de Vinificaçào," by the Visconde de Villa-Maior, Rector of the University of Coimbra. Lisbon, 1869.

begins to deteriorate, nor hurried on before it has acquired a suitable maturity. Between these extremes the growers will gain most by bottling on the first symptoms of decadence. In an air-tight receptacle such as a bottle wine exists under conditions wholly different from those possible in porous wooden vessels, permeable alike by the ethers which escape from the wine and by the outer air. In a bottle there is no evaporation nor escape of air, but a chemical reaction continues between the constituent principles, resulting in the formation of certain little-understood substances which impart to the wine many of its best qualities and an agreeable aroma, so that it acquires an increasing vitality as these processes run, more or less slowly, through their various phases.

The atmospheric conditions most favourable to the process of bottling are those in which the wine is most tranquil. Autumn and winter up to the end of March, when the weather is still and cold—neither damp, over-bright, nor thundery,—are the best times, for the reasons which render these seasons most suitable to "racking."

As regards materials, great circumspection should be observed in the choice of bottles and of the corks to be used with them. Late experiments have shown that the quality of the glass of which the bottles are made is not without effect upon the preservation of the wine. Ordinary bottle-glass, which contains a variety of alkaline, earthy, and metallic bases, is not only more fusible and malleable, but also softer and more accessible to the action of water and of the acids found in wine. In proportion as the quantity of alkali contained in the glass is greater, the excess of alkali gradually dissolves in the water, or combines with the acid aforesaid, to the detriment of the wine. In bottles of this description new wines rich in acids will *never* last, and even the fullest bodied wines run the risk of turning. Great vigilance is requisite in this respect. With the utmost care it is impossible to guarantee good results unless the bottles are made of glass of proper quality. To this end it is safest to have the glass examined by some one competent to test it chemically, which, it may be said by the way, is a very simple process. However good the bottles themselves may be it is indispensable that they should be washed, inside and out, with scrupulous care, so that they may be free from the least spot or stain of any foreign substance, and from suspicion of imparting even the slightest colour or taste to the water in which they are washed. The practice of using leaden small-shot in washing bottles to detach the harder portions of fur and crust is highly prejudicial, and should be forbidden in every case. The shot-corns often

get wedged between the sides of the bottle and its convex bottom so firmly as to defy all efforts to dislodge them. Coming in contact with the wine they dissolve more or less completely, and communicate to the latter poisonous properties, due not only to the formation of salts of lead but to the arsenic which enters into the composition of small shot. For cleansing purposes, therefore, metallic chains with small points are greatly to be preferred, though, after all, washing with suitable brushes is the best method, and various small machines exist which execute the operation very satisfactorily. The bottles should be allowed to drain thoroughly before the wine is put in, for which purpose they should be made to stand bottom upwards for a sufficient time, the necks being inserted in orifices pierced for the purpose on tables or shelves.

Corks should invariably be used as stoppers. It is very essential that they should be of good quality, fine, even in texture, and elastic, and in the case of new corks, that they should be properly cut and free from defects. The operation of bottling is by no means difficult, but it requires discrimination, cleanliness, and practical expertness. The cask should be placed at a sufficient elevation above the ground to allow the bottles and the funnel used in filling them to go under the tap without disturbing the cask. The bunghole must of course be opened when the operation commences, as the pressure of the air on the surface of the wine is required to force it through the tap; but it is advisable to provide it with a cotton cover so as to filter the air and prevent the intrusion of foreign particles held by it in suspension which might prove detrimental to the wine. In many cases it is preferable to draw the wine off with a syphon, in the bend of which a piece of cotton or some water has been placed with the same object. The bottles should be filled as full as possible, but where the needle is used in corking, two or three centimetres of the neck may be left empty to facilitate the operation.

The corks should be prepared beforehand in sufficient quantity, and well steeped in the wine itself or in good brandy. Corking machines exist of various patterns and prices. They are very useful when the operation is to be effected on a large scale, as they avoid breakages and execute the work more effectually than it can be done by hand. The great advantage of the corking machine is that it secures the complete exclusion of the air. This is managed by the introduction of a steel needle at the side of the cork. The latter is driven into the neck of the bottle by the machine, and when well home the needle is withdrawn, thus allowing the escape of the air. The elasticity of the cork at once fills up the channel thus made.

In addition to the above precautions it is desirable to cover the corks with shell-lac or with metallic capsules, and to place the bottles in a dry and airy place. Unfortunately the corks supplied by the trade are for the most part so defective that it is impossible for the grower to put his brand on them as is customary in first-class wine-producing countries. It is therefore necessary to seal the bottles with a preparation of shell-lac, Burgundy pitch, yellow wax, and some colouring matter, as red lead.

After bottling it is very desirable that the wine should stand for some time to get the full benefit of the operation—generally speaking for twelve months at least. During this period the bottles should be kept, in a suitable storehouse, in such a position that the wine may cover the corks, and should on no account be moved. Ordinary wines containing a small proportion of alcohol are apt to fur if these precautions be unheeded. Should the wine deposit any sediment after bottling (which it generally does), it will of course form on the under side, and care must be taken in moving the bottle and decanting the wine to prevent any admixture of the sediment therewith.

From the moment in which wine has been bottled with these precautions, we are justified in regarding it as secure against any access of air and any changes which such access would initiate. As before stated, it is not free from internal change from the effects of slow reactions which for the most part are beneficial in their results. These changes are influenced by temperature, light, and movement. For this reason it is essential that the place in which the wine is stored should satisfy certain conditions which befit it for wine keeping. Amongst these conditions is perfect quietude. External vibrations are unfavourable to the regular deposition of the sediment, an admixture of which with the wine would be prejudicial to the latter. The temperature is also an important point. Wines containing a small percentage of alcohol keep best in a medium temperature, varying little either way from 10° Centigrade (50° Fahr.), and in a subdued and in all cases a diffused light. Direct solar light is objectionable, less on account of its heat than of its effects on the colouring matter in the wine. Strong alcoholic wines keep best in store-rooms with a higher temperature than is suited to ordinary wines.

A San Francisco paper cautions tea-drinkers against the adulteration practised with leaves of the "Charrapal," a Californian bush. These leaves are exported to China, in large quantities. They return thence properly packed under the title of tea!

EUROPEAN FOOD NOTES.

In the beautiful and mountainous commune of X, in the Odenwald, the food of the peasant consists, in the morning, of coffee and bread or potatoes; at midday, usually of meat, principally pork, potatoes, and vegetables. On the fast days there is the usual pudding of flour, eggs, and butter; at night, potatoes and sour milk or coffee. On fête days the never-failing cake is baked; and in autumn a large provision of a kind of jam made of pears mixed with other fruit is made, which contains much saccharine matter, and is eaten with bread instead of butter. The labourers board with the farmer's family. The dietary of the peasants of Soedel in the rich Wetterau plain, in Upper Hesse, is an abundant one. First breakfast: coffee, bread, butter or conserve of plums and pears. Second breakfast: bread, cheese, and butter. Dinner: soup, vegetables, meat, farinaceous pudding. At 4 p.m.: coffee, bread, butter or conserve. Supper: potatoes, milk, butter or cheese; sometimes meat or sausage. The following is the food for six days, in Hessian weights and measures, of the labourers on a farm employing seven men and two women. The week days only are included, the fare being better on Sundays. Solid food: 13 lbs. bread, rye or barley; 12 lbs. potatoes; 4 lbs. sauerkraut; 3 lbs. cheese; 1½ lbs. salt pork. Soup: 16 loth pearl barley; 22 loth split grits; 2 loth beans; 1 lb. roasted meal. Liquids: 9 schoppen milk; 1 lb. 10 loth cream; 3 schoppen corn brandy. This gives a daily supply of—bread, 1083·330 grammes; potatoes, 1,000; sauerkraut, 333.330; cheese, 150; meat, 125; milk, 750; cream, 109·370; grains, 97·330; beans, 5·288; meal, 83·330; corn brandy, 250.*

The condition of the Bavarian peasantry is fully described in a work published in 1862 under the auspices of the Agricultural Society of that kingdom, the only change since this time being in the increased prices of all necessaries. The peasantry of the southern and northern provinces differ in character, the northern being more economical. Those in the south are fond of copious

* 1 oz. avoir. = 1·8144 Loth; 1 lb. avoir. = ·9072 Hessian lb.; 1 gallon = 8·8560 Schoppen.

fare and rather extravagant. In the southern provinces the favourite and almost universal fare of the rural population consists of meal, prepared in various ways and forms, with butter, fat, or milk. Vegetables are not much in favour, and almost the only description eaten are cabbages (chiefly in the form of sauerkraut), turnips, and potatoes. Fruit is only known in a few localities. Meat is seldom eaten except on holidays and other special occasions, and then, as a general rule, veal or young pork. Beef is scarcely ever seen. In the provinces to the north of the Danube, especially in the country surrounding Nuremberg, Bamberg, and Schweinfurth, and in the Rhenish Palatinate, where field gardening is extensively carried on, vegetable diet is very general and potatoes form a never-failing element in the daily fare. Beef, mutton, and pork, the latter both fresh and cured, are also much in use. Dishes composed of meal are only eaten on festive occasions, the custom in this respect being the reverse of that observed in the southern provinces.

The districts in which the agricultural population eats the most meat are the fertile valleys of the Franconian rivers, especially of the Altmühl, the Itz, and the Main, and in the country round Ochsenfurth, in all of which districts meat forms part of the peasant's fare on two or three days of the week, and invariably on Sundays. Coffee, usually in combination with dried chicory, or some other similar substitute, is in general use in the northern provinces; in the southern it is but little known. The Franconian peasant keeps pigs for his own consumption and fattens them in the sty. The peasant of Southern Bavaria allows his pigs to roam in the fields and on the hills and kills them whilst still small and thin, and generally weighing under 50 lbs. Potatoes are very little known in the hilly regions of Southern Bavaria. They are more frequently eaten in the plains lying between that district and the Danube; still more so in Swabia, Central and Lower Franconia, and the Palatinate. In the Upper Pfaly and Upper Franconia they constitute a staple article of food. Beer, the national beverage of Bavaria, is not consumed in such large quantities by the agricultural population as by the townspeople. As a general rule only an inferior small beer is given to farm servants.

The farm labourers on the Crown estates in the southern provinces, and on most of the large properties, receive an annual allowance of provisions according to the following scale:—Wheat, 1 scheffel = 300 Bavarian lbs.; rye, 2 scheffels, = 560 Bavarian lbs.; meat (¾ lb. three times a week, 1 lb. on each of eight holidays), 125 lbs.; butter, 12 lbs.; milk (2 lbs. daily), 730 lbs.; potatoes, 1 scheffel; peas, cabbage, etc., *ad lib.*; beer (1 mass on each of nine holi-

days) 9 mass; salt, 30 lbs.; vinegar, 12 mass. 1 Bavarian lb. = 1 lb. 3¾ ozs. avoir.; 4¼ mass = 1 gallon; money value, 12*l.* The condition of the small proprietors and labourers in the northern parts of Italy, *i.e.*, Piedmont and Lombardy, with few exceptions, does not seem very enviable, at least according to English standards. In Casale, it is true, the small proprietors live on bread, meat, poultry, polenta (maize), vegetables, eggs, and fish, and always drink wine. These stand at the head of the scale. Next come those of Vercelli whose food is Indian corn bread, sometimes wheaten bread, soup, a little home-fed bacon, poultry, eggs, milk, etc., and beef on holidays. In general they drink wine. In the mountains of Aosta the small proprietors eat but little meat, a great many potatoes and chestnuts, polenta and vegetables. In Upper Lombardy the same class is fed on vegetables, chestnuts (of which a species of polenta is made), potatoes, and coarse maize bread. Some who are a little better off than their neighbours have polenta of buck-wheat (*grano saraceno*), or Indian corn, and cheese and milk in addition. In Central Lombardy the food of the peasantry (tenants in Metayer and labourers on the large farms) is poor, and meat is only seen on great occasions. In the Upper Milanese and lower districts of Como the chief food is bread made of mixed maize, rye, and millet flour. In Brescia and Bergamo polenta is principally eaten. The morning meal is always composed of bread or polenta, and the dinner consists of a rice soup, viz., rice, water, and sometimes a little lard, with turnips and cabbages. With the Upper Milanese polenta mixed with vegetables and flavoured with a little bacon is a favourite dish. Cheese or milk, sardines or eggs, are sometimes added as a relish. In summer the quantity and quality of the food are, if possible, increased, and on large farms a little wine is given. In the poorest districts a bad heavy bread is made, and here *pellagra* is prevalent. This is a skin disease, after a time accompanied by diarrhœa and ending in suicidal mania, drowning being the invariable mode of self-destruction. The *famigli*, or labourers, on the large dairy farms in South-west Lombardy receive 2 Milanese lbs. of Indian corn bread or its equivalent in polenta in summer, and 1½ lbs. in winter; about a quart of milk in the morning and two rice soups in the day, a little sausage being added on Sundays. But the labourers in the district of Alessandria seem the worst treated. Their food in general consists of a soup made of beans, lard, and water, with a kilogramme of dry bread. In the hills they may sometimes drink wine. Among the European subjects of the Sultan, in addition to poverty, two causes appear to operate to make the diet of the peasantry less

nutritive in quality than it should be to maintain vigour—the observance of the numerous fasts of the Greek church and the penuriously economical character of the Roumelian or Bulgarian peasants, who seem in this respect to resemble the Irish. Thus in the Vilayet of the Danube the diet of the Bulgarian peasants consists rather of vegetable than animal food, though not from want of means of procuring the latter; and in the districts near Adrianople the peasant proprietors do not fare better than the labourers, and this is expressly attributed to "the economical disposition of the Roumelian peasants, who grudge any expenditure on personal comfort." The labourers receive morning and evening plenty of rye bread and porridge, onions, garlic, and other vegetables, very seldom butcher's meat; while their employers rarely taste meat, and ordinarily live on rye bread and porridge of maize and beans, seasoned with vinegar and red pepper, and also partake plentifully of dairy produce, etc.

The labourers' food about Constantinople consists of bread, French beans, cheese, olives, oil, and vegetables; at Christmas and Easter a ration of meat is given. The small proprietors of Salonica live on Indian corn or rye bread, French beans, garlic, and lentils, and seldom eat meat. At Monastir, in the same Vilayet, the agricultural labourers, peasant proprietors, and the *ortakdji*, or tenants, live variously. The food of the first-named is coarse; and, theoretically speaking, might not be considered sufficiently nutritive to keep a labouring man in health. Their bread is home-made, and it is composed of a mixture (the selection and proportions of which vary with the habits of the country) of wheaten, barley, maize, rye, and millet meal. It is formed into thick flat cakes which are badly baked. The peasantry prefer heavy doughy bread, because, they say, it better satisfies the appetite. Capsicums pounded with the seeds into a coarse powder are the universal and favourite condiment of all the labouring classes; leeks and onions, pumpkins, cabbages, and green peppers pickled in salt and water, salted cheese made from sheep's milk, beans, chick peas, lentils, and vinegar, form the other ordinary articles of diet when they can be procured. Sugar and coffee are never used on account of their cost, but grape syrup supplies the place of sugar. In the districts where it is produced, a light red and slightly acid wine, costing 5*d.* to 6*d.* per gallon, is extensively drunk. Elsewhere a spirit called raki, distilled from grape refuse and flavoured with aniseed, costing 1*s.* 10*d.* to 2*s.* per gallon, is preferred. The Roumelian agricultural labourer sticks to his work with laudable perseverance, but the average amount of it is considerably less than that of a field labourer sustained by a more nutritious and abundant

diet and malt drink. In this country, meat, fat, butter, and milk, form an insignificant item of the food of the poorer Christian agricultural classes. Their Mussulman neighbours are larger consumers of these articles, especially milk. The *ortakdji*, or tenant farmers, who are found in communities where the country is owned by large proprietors, fare somewhat better. Families of married sons live together and till the farm, and the description of the diet of a family of nine, consisting of a father, two married sons, and four children, gives an idea of at least a sufficiency of food. The bread is made of Indian corn and rye meal in equal proportions. It is baked either in the public oven, of which there is one in every village, or, in an emergency, upon an earthenware griddle heated in flaming straw and covered with an iron plate. Four or five bushels of wheat meal are kept apart for pastry and for extraordinary occasions. The family requires about 125 bushels of corn a year, which, when made into bread (15 lbs. meal to 20 lbs. bread), yields a daily average of nearly 17 lbs., at a cost of little more than one halfpenny per pound. A worn out ox or old cow is sometimes killed; part of the meat is sold at a penny per pound, part is chopped up, salted, and potted for winter use. A lamb is killed at Easter in every house, and in November and December a sheep worth 6*s.* to 8*s.* or a pig worth 1*l.* to 2*l.*, the meat being preserved in the same manner. The sheep's milk is made into butter and cheese, some being kept for family use and the rest sold. The vegetables—haricot beans, lentils, chick peas, onions, leeks, garlic, pepper, pumpkins, melons, and cucumbers,—are grown upon the half acre granted rent free with every holding, or are purchased in the market. Wine and spirits, freely used by both sexes, are made in every village.

E. Wade.

It appears that a Berlin cook named Grünberg has recently discovered a process by which a preparation of peas may be made so as to keep without becoming sour, and the Prussian Government has bought the secret of this process from the inventor for a sum of 5,555*l.* The Prussian War Office has created an establishment at Berlih capable of producing daily 75,000 sausages made of this preparation, which consists of a mixture of bacon, peculiarly-prepared pea flour, onions, and other ingredients, inclusive of salt. The sausages are sent away packed in boxes containing from 100 to 600, weighing 1 lb. each, which are destined as food for the armies, and only require to be boiled in water for a very short time to be ready for the use of the soldiers. The daily ration of each is 1 lb., a quantity quite sufficient for one man. This establishment, only working for the armies, costs daily about 6,000*l.*—*Nature.*

PUBLIC HEALTH.

Part X.—Sanitary Supervision (Central).—Continued.

4. Poor Law Board.—The twenty-second annual report of the Poor Law Board gives some most valuable information on the extent of pauperism and relief to the poor at the present time in England. It would appear that, at any given time, 4·7 per cent., or nearly one in twenty of the whole population, is receiving assistance from the public purse at an average cost of 7*l.* 10*s.* per head; and this represents a sum total of 7,673,100*l.* It seems, moreover, that of these poor people 12·8 per cent. among the out-door and 29·7 per cent. among the in-door recipients of relief are suffering from sickness and require medical aid. What is the existing organisation for their relief? What influence has the Central Board on the Public Health of England? The Statute of the 49th of Elizabeth gave the key-note of our modern poor law. With mingled tenderness and severity it directed that "the lame, impotent, old, blind, and such others among them being poor and not able to work," should be provided for; the able-bodied, whether married or unmarried, should be put to work, and children apprenticed. It took no special heed of the *sick* poor. The first general enactment providing medical attendance was passed, as I learn from Dr. Rumsey's valuable essay on "The Medical Care of the Poor in England,"* in the year 1790; but it was not till 1834 that medicine was admitted under the Poor Law Amendment Act as an essential branch of the ordinary relief to the poor. At the present time no less than 3,906 medical officers, 1,336 relieving officers, 689 nurses, and 98 male nurses,† are devoting themselves wholly or in part to the necessities of the sick; and their conscientious ill-paid labours are rarely appreciated as they should be. With such a field and such an army of workers what should not be done for the public health of England?‡ When it is remembered that the

* "Essays on State Medicine," No. IV.

† 22nd Annual Report of the Poor Law Board.

‡ The following was one proposition among others which was recently laid before the Right Hon. G. J Göschen, President of the Poor Law Board, by a joint deputation from the British Medical and Poor Law Medical Officers' Associations:—"That medical relief and the sanitary care of the poorer classes are questions which ought not to be treated independently of each other."

Poor Law operations extend to the remotest corners of the country, to the meanest hovel on the lonely moor, to the darkest alley in the densest town, to the very haunts of hunger and vice, where fevers begotten of dirt and ignorance thrive and spread in ever-widening circles; where children, alas! are born but to die from unsanitary conditions, if not from actual starvation and neglect;—when we consider, moreover, the opportunities for accumulating statistics of disease, for preventive measures, for instruction in the simplest laws of health, which have been enjoyed through so many years—it will indeed seem strange and beyond belief that nothing has been done for the Public Health; that the zeal for sanitary work which we have noticed in other departments of Government should in the Poor Law Board have been hitherto conspicuous only by its absence. Many circumstances have conduced to this result. The very fact that medical relief is an outgrowth from the general relief—supplied from the same fund, and in part by the same officers—has tended to make sickness in the poor an offence to the rate-payers, whose sole object has seemed to be to contract for its attendance at the lowest possible price. The sad and horrible details revealed by Mr. Ernest Hart, Dr. Bridges (now himself a Poor Law Inspector), and others, concerning the sick wards in metropolitan and many provincial workhouses will not readily fade from the memory. It is but a small leaven of tenderness that remains to us in our Poor Law Code.

The abuses so rife in 1834 may have been checked, but they are not eradicated; and though Boards of Guardians in some directions may, by their recent acts, have led Mr. Göschen to speak hopefully,* the majority would seem to agree with Bacon that "generally it is to be foreseen that the population of a kingdom, especially if it be not mown down by wars, exceeds not the stock of the kingdom by which it is to be maintained," and they take their measures accordingly.† Sympathy is banished, human kindness is crushed out by the all-absorbing consideration of cost. From these few remarks we can, I think, understand why no independent efforts have been made by the Poor Law Board, as a central autho-

* 22nd Report Poor Law Board, p. 39.

† A recent writer describes the Poor Law of England as a "Code unrivalled by the most malignant ingenuity of former or contemporary nations; a Code wherein, by gradual accretion, has been framed a system of relief to poverty and distress so impolitic, so unprincipled, that none but the driest, mustiest, most petrified parish official could be expected to lift up his voice to defend it; so complicated that no man under heaven knows its length or breadth, or height or depth; yet it stands to this hour a monument of English stolidity—a marvel of lazy and ignorant statesmanship."—*Ginx's Baby.*

rity, for the Public Health, and the constitution of the Board itself will, perhaps, afford still further explanation. By the Act of 1834 three Commissioners were appointed to form a Board, in conjunction with the Lord President of the Council, the Lord Privy Seal, Her Majesty's principal Secretary of State for the Home Department, and the Chancellor of the Exchequer, for the time being, as *ex officio* members, with two Secretaries who are to be appointed from time to time. Medicine was not represented, and even the Inspectors, thirteen or fourteen in number, named under the Act, whose duties involved hospital inspection and often decisions on the nicest medical questions, were up to a very recent date selected chiefly if not exclusively from the Legal Profession. In the words of Dr. Rumsey,* "The Poor Law Commissioners persisted in treating medical attendance merely as a department of parochial relief which it was their duty to reduce with the rest to its lowest possible cost. Parliament interfered not, either to correct the mistake or to enlarge the view. . . . It may be safely asserted that a course more opposed to sound principles of public health and public economy—to equity, reason, and humanity—has been seldom pursued under official authority in this country than that which was adopted with respect to the medical department by the Poor Law Commissioners and their secretary, and by Boards of Guardians under their influence." There are now two Medical Inspectors acting under the Board.

The independent influence, then, of the Poor Law Board as a central public health authority must be considered dormant. Yet its organisation has formed the framework for Statistical Records and Sanitary Government in the several health departments.

It should never be forgotten that the first of a series of enquiries which led to the passing of the Public Health Act was due to Mr. Chadwick when Secretary of the Poor Law Commissioners. We have seen, too, that the Unions of Parishes arbitrarily constituted by the Poor Law Board have, wisely or unwisely, been made the units for enumeration and statistical purposes, the registration sub-districts and districts of the Registrar-General, as well as in most cases the areas for Local Government in matters pertaining to the Public Health.†

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* "Essays on State Medicine," No. IV., p. 17.

† In a Paper recently read before the British Association at Liverpool, Mr. Alfred Haviland strongly advocates a change from the present artificial districts for Registration, etc., to natural areas marked out by the water-sheds and river systems of the country. See also Mr. Michael's Paper on Sanitary Laws, read before the Social Science Association at Newcastle in the present year.

The Medical Officers of the Board, distributed as they are through the length and breadth of England, would seem admirably adapted to carry out certain measures of Public Health; and they are employed, as we have seen, under the Privy Council for this very purpose.* At the same time it may be doubted whether they are in the best position to give effect to an unpopular Act, or to encounter the opposition and odium which are met with in all sanitary reforms. Vaccination is a case in point. In the year 1840 Government, wishing to extend the practice of vaccination, which was at that time very imperfectly carried out, passed an Act directing Guardians and Overseers to contract with their Medical Officers for free vaccination in unions and parishes—the expenses to be paid out of the rates—although (by an Act passed in 1841) the operation was not to be classed under the head of Parochial Relief. Still, vaccination was stamped with pauperism, and was inseparably connected with it in the eyes of the people. It was not carried out, and in 1853 compulsory measures were resorted to for its more complete performance—compulsory measures to be enforced under the same Poor Law direction. What wonder that prejudice was aroused! and that the law is to this day evaded in the face of Poor Law Officers, Privy Council, and Acts of Parliament!

But we must leave the consideration of Local Government in Health matters to a future occasion, and confine our attention for the present to central authorities.

The last to which I shall briefly allude is *The Board of Commissioners in Lunacy.*

E. T. Wilson.

[to be continued.]

Professor Gunning, of Amsterdam, has succeeded in purifying water by the addition of a little chloride of iron, and afterwards by a like quantity of carbonate of sodium. One litre of by no means clear water from the river Maas required but ·032 gr. of the chloride. The precipitate always contains (in addition to the iron, lime, clay, and sand) organic particles containing nitrogen. The *Deutsche Illustrirte Gewerbezeitung* mentions that air pumped into such water has a similar effect, oxidizing the organic constituents and causing a precipitate of the muddy and mineral parts.

Improving Wine by Electricity.—At Digne in Germany several butts of wine were shattered by lightning, and their contents passed along the floor into a cistern beneath. It was found that, far from having suffered by the accident, the wine was improved so as to sell at 60 instead of 10 cents per litre. Subsequent experiments tend to show that a current caused by the immersion of two platina electrodes in connection with a galvanic battery have a similar effect on wine. Even poor wines seem to assume an agreeable flavour through the process.

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* Under the Vaccination and Diseases Prevention Acts.

THE FOOD OF THE POOR.

I HAVE often wondered, whilst walking through the lower parts of Liverpool, by whom the miserable food is consumed which I have noticed in the windows of some of the provision dealers. Nothing can be more uninviting in appearance than the bacon and fish which are exposed for sale in many of the smaller shops; and the natural inference is that it must be purchased by the very poorest labourers at a nominal price.

I have lately made enquiries on the subject from the men in my own employ, and at certain of the shops which had attracted my attention, and although, from long association with the working classes, I was aware that they pay more for their daily food than they need do, yet I was surprised to find that they pay a high price for this trash, and that in many cases they might go into the first establishments of the town and buy the best provisions for less money than they give in their own immediate neighbourhood. For example, the most important article of food consumed by the lower classes is bacon. This is sold in the smaller provision shops in the low parts of Liverpool at prices varying from 6*d.* to 10*d.* per lb. My attention was recently attracted to some yellow fat in one of these shops, and on entering I found it to be "reasty" bacon, of which large quantities are sold at 7*d.* per lb. This stuff was perfectly rancid, and yet sound, wholesome, though poor bacon could be bought for the same money in neighbouring parts of the town. Very inferior bacon was also sold in the same shop at 10*d.* per lb.—the price at which the best is to be obtained at the Italian warehouses in our most fashionable thoroughfares.

Take another instance. In some of the smaller shops tea, which is a staple amongst the poor, is sold at from 1½*d.* to 3*d.* per ounce, or from 2*s.* to 4*s.* per lb. Now the 4*s.* tea is such as may be purchased at from 2*s.* 8*d.* to 3*s.* per lb. in our large grocery establishments, and is the cheapest tea to be procured of decent quality. In other words, the poor man pays 30 per cent. more than I should for the privilege of buying the same article by the ounce; and I leave the reader to imagine the kind of tea which is retailed in ounces at 2*s.* per lb.

Articles of fresh food which are brought from a distance in large quantities are often better and afford more valuable nutriment than might be expected. For instance, whilst the middle classes used to pay from *1d.* to *2d.* each for new laid English eggs, Irish eggs may be bought in the humbler shops at 14, 16, and 18 for a shilling, according to size. I purchased one of these at a little shop in a low part of Liverpool some time ago, and could hardly distinguish it from a fresh egg. Of course there is great chance of the poor getting stale eggs, and especially those whose custom is a source of risk to the shopkeepers.

And this brings me to another phase of the subject, namely, the difference in the food consumed by the cash as compared with the credit customers. Two elements have here to be considered, though in the long run they almost resolve themselves into one, viz., regularity of employment and sobriety, both eventually merging into what may be called steady habits. The wages of a labourer—not of a skilled artisan—in Liverpool vary, on the average throughout the year, from *16s.* to *17s.* per week; those of the *élite* of operatives, from *23s.* to *24s.* per week. The daily wages are no criterion. I lately spoke to a young man in a branch of the ship-building trade the members of which had struck for an advance of from *6s. 6d.* to *7s.* per day, and found that notwithstanding this apparently high rate of daily wages, the average never exceeded *15s.* per week, and was probably less.

The character of the food consumed by all except those who are in constant employment depends to some extent on the impression which they give to shop-keepers with whom they are in the habit of dealing. I have a very high opinion of the class from whom the poor purchase their provisions. They are often very kind and make great sacrifices; and many a poor labourer's family—aye, many thousands—have been kept from starving, or from disease and death the result of imperfect nourishment, through the credit granted to them by their neighbours who are shop-keepers, often almost as poor as themselves. But trade is trade. Great bankers sometimes keep swindlers and extravagant livers afloat, and help them to rob others so as to enable them to reduce their balance and to play on at the roulette table of trade in the hope that a lucky number may turn up at last. This is not, I believe, the character of those upon whom a struggling labourer depends for credit in hard times. If he is sober and steady he need not starve, but if otherwise there is nothing to stand between him and the workhouse. A steady, honest labourer, then, finds but little difference, if any, in the price or quality of the food supplied to him in his hour of trouble when

credit is indispensable to him; and this is so, notwithstanding that the risk of the shop-keeper is much increased, and his property is staked upon the luck of his poor customer in obtaining work, or the hand of Providence in inflicting or staving off illness. When, however, a small tradesman finds that he has two classes of customers to deal with—those who are sure to pay at some time or other, or, if they do not, are at least defaulters without any breach of morality; and those who are squandering their means in drink, and who consider food a secondary need,—he naturally reserves his best wares for the former and sells his trash to the latter, often knowing, as he hands it over the counter to a starving wife, that her husband is in a gin-palace hard by, spending the very money which he ought to be paying for food. Leaving out of sight the question of morality, the physical result is this: sober men and their families, with constitutions able to bear privations, obtain the best kinds of nourishment sold to the poor, but in the bustle of trade it often happens that they suffer indirectly for the intemperance of their neighbours, from being supplied by unscrupulous shop-keepers with provisions which would not be sold at all if drunkards did not make a market for them; whilst the latter, with feeble frames themselves and half-famished children about them, fall victims to disease, engendered not only by insufficient but by unwholesome food.

There are hundreds and thousands of working men in England to whom these remarks are wholly inapplicable; who buy good food, and know when and where it is to be obtained on the most reasonable terms, and who can make a penny go farther than twopence of a wealthier neighbour. Temperance, hard work, and a contented mind give to such food a flavour and a value to the poor consumer which would never be afforded by far more luxurious diet amongst the higher classes.

James Samuelson.

Consumption of Sugar.—The Anglo-Saxon race, including Great Britain, her colonies, and the United States, heads the consumption with 1,142,000 tons per annum, or 41·40 lbs. per head. Next comes the Latin race, viz., France, Italy, Spain, Belgium, Portugal, and Switzerland. In these countries 506,000 tons are used annually, or 12·34 lbs. per head. The Teutonic race, including the Zollverein, Austria, Holland, the Hansetowns, and Denmark, consumes 262,000 tons of sugar, or 7·30 pounds per head per annum. Last of all comes the vast but poor district under the sway of the Czar, the Ottoman Empire, and Greece. Russia, Poland, Turkey, and Greece consume together less than half of the quantity used by the Teutonic race, namely 125,000 tons, or 3·30 pounds per head.—*Verein für Rübens.-Indus.*

HOW TO EAT AND HOW TO DIGEST.

Part II.

Returning, not exactly *à nos moutons*, but to the beef question of my former paper,* we must always bear in mind that a bullock is an animal capable of anatomical, and therefore gastronomical division. As the tenderness of the meat depends partly on the anatomical relations, it follows that those muscles which are least called into action are always more tender in fibre, and therefore more easy of digestion. Again, the tenderness of meat will greatly depend upon the proper length of time which it has been allowed to hang before cooking—a fact which most housewives well know, but few put into practice. This hanging process slightly separates the muscular fibres, and also developes some stimulating properties in the meat. Indeed it is the first step to decomposition, but it really renders that same joint tender which, unhung and fresh from the shambles, would set the jaws of the whole family aching. Let the butcher, therefore, be asked when the meat was killed, and let it be hung in accordance with his answer. In cold weather meat will keep for five or six days, but in close, thundery, summer weather it must be cooked the day after it has been killed. However, in this matter as in all others, experience is the best guide. Let the meat hang long enough to be tender but not long enough to degenerate, for tough meat will give rise to indigestion and putrid meat to diarrhœa; and this last fact ought to be kept carefully in mind by those whose bowels are easily relaxed, and by convalescents from fevers or exhausting diseases. Game is generally supposed to be tender, nourishing, and light food, and therefore a suitable forerunner to butchers' meat; but let the partridge or grouse be served "high," and an attack of diarrhœa will be the almost inevitable and disappointing consequence. *Experto crede.*

As some housewives may not always wish to receive the butcher's statements as so many axioms or self-evident propositions, the following data on the quality of meat may be interesting and perhaps useful. The fat should be fair in quantity but not excessive, for an excess of fat lowers the proportion of albuminous food; and as physiologists tell us that albumen is a very fine thing in the way of nourishment, those who wish to be well fed cannot possibly get

* See "Food Journal," No. 6, p. 315.

mical form of food, and the economy of soup dinners has yet to be learnt by our wasteful English cooks.

Abroad, *cela va s'entendre sans dire.* At home cooks are, as a rule, wasteful from pride and ignorance, and mistresses are too careless, and frequently too ill informed in household matters, to correct these abuses. We are delighted to *read* of the domestic difficulties of Dora in "David Copperfield," but few of us would care to *experience* them in our own homes. Nevertheless hundreds of young married couples put up with as much roughing as soldiers in a campaign, merely from lamentable ignorance of household arrangements on the part of the otherwise charming wife. "How I *mis*managed my house on 200*l.* or 500*l.* a year" would be the appropriate title of a true account which young housewives might often furnish of their first or second year's domestic doings.

The disadvantages of soups are that their long continued use, though soothing to an irritable mucous membrane, yet weaken the muscular fibres of the bowels, and thereby give rise to indigestion—an indigestion which is more difficult to meet inasmuch as the cause is often unsuspected. In the celebrated case of St. Martin, Dr. Beaumont noticed that half an hour after St. Martin had dined on beef soup the absorption of the watery part had gone on so fast as to leave the remainder of even a thicker consistence than after an ordinary solid meal. It would not surprise us, then, if this "too solid" remainder caused some twinges of indigestion. A good plan, therefore, in making soup for delicate stomachs would be to add some solid materials, as vermicelli, macaroni, pearl barley, rice, and bread, that shall rather arrest the too rapid absorption of the liquid food. It is useless to condemn liquid food entirely, or even to banish it from our own dinner table as a needless accessory. Physiologically it may have great value for those who hurry to and from their meals, as it allows an interval of comparative rest to the fainting stomach before the more substantial beef and mutton is attacked, rest before solid food being as important as rest after it. Let a hungry and weary merchant or lawyer rush in *medias res*—plunge boldly into roast beef, and what is the result? The defeat is often as precipitate as was the attack.

When the body is weary the stomach must be identified with it, and cannot therefore stand the shock of some ill masticated half-pound weight of beef. But if a small plateful of light soup be gently insinuated into the system, nourishment will soon be introduced, and strength will follow to receive more substantial material. After long fasts and long walks nothing is so common as sudden indigestion. The walk is taken with a view to gain an appetite,

but it too often destroys it by weakening the nervous energies. A few mouthfuls of soup with a crust of bread is to the faint and hungry more commendable than a pyramid of beef and potatoes.

Soup leads so naturally to fish that we cannot do better than discuss them next. The white-fleshed fish are the easiest of digestion, and are therefore most suitable to weak stomachs and convalescents from illness. The red-fleshed, on the other hand, are firmer in texture, and contain a larger proportion of oil. This firmness of fibre it is that makes them more difficult to digest, while the oiliness is so much gall and bitterness to the bilious. Whiting and soles, flounder and bream, are the convalescent's true friends; cod and turbot are his occasional friends; mackerel are doubtful friends; salmon and eels are his sworn enemies. Trout and grayling are delicate and occasional fare, and are to be relied on. Jack is coarse fare, and if we follow Izaak Walton's recipe we shall make it indigestible fare. The grey mullet is a casual visitor, the red a scarce one. Both are naturally rather firm in texture, and both are too apt to be smothered in oily sauce, and should therefore be looked upon with a suspicious eye when thus apparelled for the table. I will not touch on the faults or virtues of shark or whale, as, like the elephant chops ordered by the Yankee traveller, this would imply an order for the whole animal. Oysters fresh from the shell are light and nourishing, but if you cook them you convert the light into the indigestible; if you leave them to die and get only slightly "turned," you have decaying matter. When autumnal diarrhœa is prevalent the dead oyster might make unpleasant retaliations on its consumer; so beware! Lobsters and crabs are ornamental to a degree in their scarlet "liveries dight" when they flank a supper table, but the stomach must indeed be encased in *robur et æs triplex* that can engage in their consumption. It would be well for those of weak digestion to avoid these seductive crustaceans. Salted fish, though appetising as a rule, is not easy of "appropriation," and should therefore be eaten at breakfast rather than supper. Neither shrimps nor prawns are safely to be trusted. When I hear of the shells of shrimps being consumed by some daring individuals I can only sigh over their degenerate taste and close this chapter, for to such heroes in gastronomy my words would be vain—*velut ægri, somnia vani.*

E. B. Shuldham, M.D.

THE MANUFACTURE OF PRESERVED MILK.

IT is scarcely a matter of wonder that when rapid increase of population or a deficiency of supplies causes our usual articles of diet to become scarce, manufacturing ingenuity steps in to fill the gap; and this is the reason why so much activity is displayed in these days in the production of artificial or concentrated provisions. Not the least important in this class is the preparation of preserved or condensed milk, which is fast assuming considerable dimensions both in the demand for it and the capital embarked in its manufacture.

Like several of our specialities in food, preserved milk is an American invention, and has for some years been largely produced in New York by what is known as Bordon's process. As a valuable substitute for the presence of the cow at sea, or during exploring expeditions in which portability is a *sine quâ non*, it has long been known and used; but it has been only of late that it has been proposed to displace to a certain extent the "sky-blue" which rejoices the hearts of town residents. That it will eventually be used in considerable quantities we have not the slightest doubt, especially when we find that the most common form of adulteration in our milk, viz., that of water, is a practical impossibility in this case; so that, as far as the milk is concerned, its consumers may rely on having a really pure article. The English market is mainly supplied with this preparation from three sources. 1. The English Condensed Milk Company. 2. The Swiss (or Milkmaid Brand) Company. 3. The Irish factory at Mallow, erected by Mr. Newnham. "Caparisons are odorous," as Mrs. Malaprop says, and we will therefore avoid them, the more especially as we feel that whatever inferiorities may exist in either of the milks they are very trifling, and caused by some deficiencies in manipulation that a little time and experience will soon set to rights. As a visit to one establishment may stand for all (the process being essentially the same), we have naturally selected the one which is the nearest, viz., that of the English company at Aylesbury, which has been in operation for about four months. It is scarcely necessary to state the reason for the selection of this locality by the proprietors, which was that the Vale of Aylesbury is especially noted for the richness of its grazing land and the purity

of its milk, butter, and cheese—the first step towards securing excellence in the manufactured article.

The first and last point which strikes the visitor is the excessive and almost amusing cleanliness which pervades the whole establishment from the time that the milk is first brought into the factory to when it leaves it in its portable state.

The usual quantity which is at present worked up daily is about 420 imperial gallons, the produce of from 200 to 250 cows in the neighbourhood. The cans as soon as emptied are turned upside down, and subjected not only to a strong column of water but also to one of steam, which is forced in at tremendous pressure, and finds its way into every nook and cranny. Indeed the utmost care is taken to prevent the smallest particle of milk remaining, it being well known to scientific men that even a microscopic atom of sour or stale milk will spread like yeast, and be sufficient to contaminate any quantity with which it may be placed.

The milk is first run into a reservoir over a strainer so as to remove all hairs and impurities, and is then removed by large swinging cans into another tank of hot water so as to keep it up to a certain temperature. The next operation is to add the best cane sugar (about one-third in weight); for it must be remembered that without this addition the condensed milk would not keep more than four or five days, whereas with it it will be available for as many months, and probably very much longer.

The mixture of milk and sugar is then passed up through a tube into a vacuum pan in the room above, where the process of condensing is carried on. The object of this is to evaporate the water of the milk, which gradually becomes more and more pasty, and is finally drawn off with a consistence like very pale liquid honey.

It is next cooled and run into tins, which are soldered down, and is then ready for sale. Although the process as here described sounds very simple and easy, it is not so in reality, the making or marring of the condensed milk depending almost entirely upon the regulation of temperature and those niceties of manipulation which experience only can point out. In New York a large trade is done not only in sweet milk, as this condensed preparation is called, but in plain condensed milk without the addition of the sugar. It is sold in the city at the price of the ordinary dairy milk, and, as it keeps well from four days to a week, it offers many obvious advantages.

The factory of the Anglo-Swiss Milk Company is at Cham, near Zug, in Switzerland, and presents the same features of ex-

treme care and cleanliness. Indeed, *ceteris paribus*, the only distinction between the English and Swiss establishments, if there be any, is a possible difference in the virtues of the respective pastures. Some agriculturists say that the richness of the Swiss "feed" is greater than that of the English, while others consider that this advantage is neutralised by the Swiss cows being kept in stalls and being used for a certain time of the year in farm labour. The cows of the Swiss Company, however, are turned out for a certain number of hours every day, so that they are not subject to what would otherwise be a disadvantage. As regards the two milks there is scarcely any perceptible difference, and if the experiment is tried with either by adding four tablespoonfuls of water to one of the condensed milk and allowing it to stand for some hours, a distinct layer of cream will rise to the surface. In addition to the advantage of portability it has that of never turning bad after the tin has been opened, the only result of long continued exposure to the air appearing to be the formation of a slight film of crystallised sugar, which is most probably the reason of its protection.

Theoretically, too, condensed milk is superior to desiccated milk in the form of powders, for, to produce powders the globules which contain the true butter element are necessarily broken or decomposed, and half the original virtues of the article destroyed. Among other good points of this class of food we must also observe that it is peculiarly available for the use of children, who ought álways to have the quality of their milk uniform, whereas, even under the most favourable circumstances it is not always possible to obtain this desideratum, and still more seldom in towns.

Before quitting the subject we would mention that the English Condensed Milk Company at Aylesbury is about to apply the same condensing process to cocoa and milk, so that the consumer of one of their cocoa tins will find everything ready to hand save the boiling water. Some of this preparation was made for us on the spur of the moment during our visit, and we can safely say that the result was the *best* cup of cocoa that we have ever tasted.

THE following is a simple means for detecting the adulteration of arrowroot or starch by flour, as given in Böttger's *Polyt. Notizbl.*:—Mix 1 grm. of starch with 180 cub. c. of water; heat the mixture to the boiling point, and stir it well and without interruption. The genuine arrowroot or starch will not leave a trace of froth on the surface as soon as the stirring is ceased; but an admixture of flour will give a considerable and lasting froth, even if the percentage of the adulteration is trifling.

POPULAR FOOD ANALYSIS.

No. 10.—WINE—Continued.

After fully considering the history and composition of wine last month, we arrived at the difficulties attending an analytical investigation of its adulteration, and we decided that no wine should be treated as sophisticated unless evidently manufactured from some other base than the produce of the vine, or contaminated with some poisonous substance, such as lead, introduced in the course of manufacture. The evidence of a wine having been made from any foreign vegetable matter is best got at by an examination of the various vegetable acids which it contains taken in conjunction with the amount of phosphoric acid present in the ash, and the absence of any special characteristic which the particular class of wine should present. These points will become evident as we proceed with the subject and do not require further notice at present, so we will at once pass on to the consideration of each special class of wine.

Sherry.—This wine is the produce of the province of Andalusia in Spain. It is grown in the greatest perfection near the town of Xeres de la Frontera. That sherry has been known and appreciated in Britain for many centuries is proved by several references to it in the writings of Shakespeare, such as the following:—

> "Good sherris-sack ascends me to the brain, dries me there all
> The foolish dull vapours, and makes it apprehensive."

It appears to have been consumed under the name of sack, in earlier times than those of the great dramatist, for we find that even Chaucer mentions it frequently under both denominations. Doubtless this referred to dry sherry, and was a corruption of the French *sec*, dry. The grapes which produce this wine are chiefly grown in a sandy soil, but Don Simon de Roxas, a native author, divides the grape-growing lands of the district into four classes—

(1) *Albariza*—chiefly carbonate of lime, sand, clay, and magnesia.
(2) *Barros*—composed of quartz, sand, clay, yellow and red ochre.
(3) *Arenas*—entirely quartz sand.
(4) *Bugeo*—quartz sand, vegetable loam, and carbonate of lime.

The *Albariza* is the soil on which most of the San Lucar and real Xeres wines are grown, while the *Bugeo* is the worst and most unproductive of the four varieties. This is in some measure caused by its splitting in the warm weather into immense fissures, so that the vines have to be planted nearly six feet apart.

Sherry is made thus. The grapes are harvested as they mature, and are spread out on mats in the sun. After some days they are carefully picked clear of stalks and unripe or decomposed fruit, placed in vats, and covered with a layer of plaster of Paris. Peasants with wooden shoes then get into the vats and trample the grapes till they part with all their juice, which is run off into suitable vessels and placed in the cellars to ferment. This fermentation goes on during nearly two months, and at its conclusion the wine is separated from the dregs or lees, and is then ready for exportation after the customary addition of brandy. It is a common thing to add an infusion of bitter almonds to communicate the well-known nutty flavour of fine sherry. When this wine is first produced it is fiery, and has to be matured by keeping for several years. The "maturing" of sherry is an important point, as it does not really attain perfection for bottling until twenty years from the date of vintage. The connoisseurs of old knew as well as our wine bibbers of the present day the value of old wine, and chiefly of old sherry. In Pasqual's Psalmodia, published in 1619, we find—

"Give me sacke, old sacke, boys,
To make the muses merry.
The life of mirth, and the joy of the earth,
Is a cup of good old sherry."

Such is the method of manufacturing pure sherry. But unfortunately very little of the cheap wine consumed in England is made in this way. Thousands of gallons are yearly produced in the South of France as well as in Hamburg. These wines are chiefly made from a grape base, but also from cider and malt. When a grape base is used a white liquor or "must" is employed for the purpose, which is known in France as "unboiled calabre." This is made by expressing the juice of inferior grapes and mixing it with brandy in the proportion of 9½ gallons to every 22 gallons of must. Sherry is thus made by a process such as the following:—

Calabre	5½ gallons.
White sugar	1 lb. 2 oz.
Elder flowers	3 drachms.
Lime flowers	3 ,,

Treat the above ingredients as if making an infusion of tea, and when cool add the must. Let it stand for two months, clarify with isinglass, and bottle. A very nice Madeira may also be made by calling in the aid of the Pharmacopœia, thus—

Calabre	5½ gallons.
Dry figs	3 lbs.
Lime tree flowers	4 oz.
Turkey rhubarb	4 drachms.
Socotrine aloes	½ ,,
Almond shells, roasted like coffee	17 ,,

Boil the ingredients for one minute in two quarts of the must; add nearly a pint of an infusion of green nuts and 5 drachms of liquid spirit of tar. Stir up the whole, let it stand for two months, strain and bottle. When sherry is to be made from a malt base a process such as the following may be resorted to :—

Pale ale wort, without hops	4 gallons.
Cold water	7 „
Sugar	16 lbs.

Boil together; pour into a tub, add 4 lbs. sugar candy, and ferment with brisk yeast for four days. Rack off; add 5 lbs. Malaga raisins, bruised and stoned; stir up frequently for two days, and add a gallon of brandy. The resulting liquor will be ready for bottling in three months. Sherry may also be made from cider, parsnips, etc., by processes too numerous to mention.

Sherry grapes grow sometimes at a great elevation, and in the mountains around Malaga three distinct harvests are gathered every year. The first takes place in June and the produce is made into raisins. In September the second harvest is gathered and produces an inferior sherry. In October and November the same vines yield the low-class liquor known as "mountain sherry."

The following are the results obtained from very careful analyses of cheap and other sherries purchased in London or procured by private favour. The amount of the volatile etherial substances which give the flavour to wine are not estimated, but are classed with the water, as they exist only in very minute proportion, and their estimation is both too tedious and uncertain to be of value in such results.

(A) Analysis of a sample of genuine Sherry received from a known source.

Alcohol (by weight)	16·560
Volatile acids	·035
Fixed acids	·436
Cream of tartar	·014
Tartrate of lime	·070
Grape sugar	1·525
Extractive matter	1·163
Phosphoric acid	·045
Undetermined mineral matter	·486
Water	79·666
	100·000

Note.—After removal of the cream of tartar the vegetable acids found were chiefly tartaric, with a decided trace of citric and a *very minute* one of malic. The tartrate of lime was much larger than the cream of tartar, and the undetermined mineral matter copious, doubtless from the amount of lime used in the pressing. The volatile acidity (vinegar) is small.

(B) Analysis of a sample of Hamburgh Sherry received from a private and reliable source.

Alcohol	15·500
Volatile acids	·125
Fixed acids	·396
Cream of tartar	·030
Tartrate of lime	·025
Sugar	2·500
Extractive matter	·900
Phosphoric acid	·014
Undetermined mineral matter	·215
Water	80·295
	100·000

NOTE.—The vegetable acids in this case showed a large increase in citric acid and a more decided trace of malic. The phosphoric acid is reduced to nearly one-third of that in the genuine wine, while the cream of tartar is large, having no doubt been purposely added, while the tartrate of lime and mineral are very small. The volatile acidity (vinegar) is large, and shows a tendency to decomposition by keeping.

(C) Analysis of five samples of Sherry purchased in London.

	No. 1. Price 7s. per gallon.	No. 2. Price 6s. per gallon.	No. 3. Price 5s. 4d. per gallon.	No. 4. Price 6s. per gallon.	No. 5.
Alcohol	15·650	16·920	10·825	15·130	15·710
Volatile acids	·166	·085	·247	·106	·141
Fixed acids	·415	·493	·348	·320	·387
Cream of tartar	·039	·017	·013	·022	·020
Tartrate of lime	·090	·022	·075	·031	·040
Sugar	1·801	1·790	·348	2·700	2·130
Extractive matter	1·009	1·084	·909	1·390	·852
Phosphoric acid	·019	·029	·034	·016	·033
Mineral	·258	·254	·493	·217	·371
Water	80·553	79·306	86·708	80·068	80·316
	100·000	100·000	100·000	100·000	100·000
Opinion of an experienced wine taster	Not genuine sherry.	Not genuine sherry.	Originally genuine, but much reduced.	Not genuine sherry.	A mixture, and doubtful.
Comparative amount of vegetable acids.	Too much citric.	Excess of citric, etc.	In proper comparative proportion.	Too much citric and malic.	Not in proper proportion.

Thus we see that only one sample bore the characteristics of having been once a genuine dry sherry, but it had been so reduced with water and was still becoming every day more sour (although chalk had been already added to correct the acidity) that it certainly was not wholesome. The remaining four had not been manufactured probably from anything else but common grapes not perfectly ripe, and were therefore certainly wine; but to sell them as sherry was not correct, as they were deficient in every characteristic

of the genuine wine, and in point of nourishing material they fell very short of the mark. Except No. 2 they were all in various stages of sourness, and were certainly not wholesome or fully fermented beverages, while the nature of the separated alcohol showed distinctly that they had been fortified by a raw grain spirit containing abundance of fusel oil. In conclusion we should say that the poor invalid who is compelled to trust to such an article is much to be pitied, and that the workman who, tempted by the price, leaves his beer for a few glasses of this "sherry" will not require to be reminded of the fact that he has a head on his shoulders in the morning. It is not by the introduction of such compounds of potato syrup and spirit, cream of tartar, artificial ethers, and a little grape juice, that the people of England are, we hope, to be diverted from the unpretending but infinitely preferable malt beverages of their own country.

PORT.—Port is produced in the districts of the Douro and sent to this country from Oporto. It is manufactured from eight distinct kinds of grapes, of which that known as "Bastardo" yields the finest wine, while that called "Souzao" is the worst. The "Bastardo" ripens early, in small black clusters, and yields a rich but slightly coloured wine, with a splendid flavour and delicious aroma. The liquor produced from the "Souzao," on the other hand, is rough, astringent, and so highly coloured that it is employed entirely for adulteration. It is difficult to say what ought to be really the characteristics of good port wine, as various seasons produce liquors of different quality; but it may be taken as a fact that pure port rarely possesses the degree of sweetness and depth of colour found in many of the wines which are drunk in this country. Of all the varieties of Douro grapes the "Bastardo" is the only one which invariably produces wines with a certain amount of sweetness. Unfortunately for the consumers a remarkable vintage occurred in the year 1820, during which all the wine produced was black, strong, and sweet. This liquor happened to please the palates of the connoisseurs, and ever since the aim of the merchants has been to send to this country what they call "full, high-coloured, and fruity wine," quite irrespective of the qualities of the subsequent vintages. The effect of this is that we seldom or never receive in England the genuine, unadulterated, and natural wines of the Douro.

In 1844 an able though anonymous pamphlet was published on this subject which thoroughly exposed the whole fraud, and from it we find that wine is prepared for the English market in one or other of the following manners. The grapes being flung into the

open stone vat indiscriminately on the stalks, sound and unsound, are trodden by men till they are completely mashed and then left to ferment. When the wine is about half fermented it is transferred from the vat to casks, and brandy (several degrees above proof) is added in the proportion of 12 to 24 gallons to the pipe of must, by which fermentation is greatly checked.

About two months afterwards this mixture is coloured thus. A quantity of dried elderberries is put into coarse bags, which are placed in vats, and a part of the wine to be coloured being thrown over them, they are trodden by men till the whole of the colouring matter is expressed, when the husks are thrown away. The dye thus formed is applied according to the fancy of the owner, from 28 to 56 lbs. of the dried elderberry being used to the pipe of wine. Another addition of brandy of from 4 to 6 gallons to the pipe is now made, and the mixture is afterwards allowed to rest for about two months. If now sold it is transferred to Oporto, is racked two or three times, receives probably as much as 2 gallons more of brandy per pipe, and is then considered fit to be shipped to England, it being nine months old. At the time of shipment another gallon of brandy per pipe is added. The wine has thus been fortified by at least 26 gallons of brandy per pipe, and is considered by the merchant sufficiently strong, an opinion which few of us are likely to dispute.

Another way of colouring is this. The finer sort of grapes are selected of various kinds, those which are decayed or unripe being removed. They are then trodden, as in the preceding case, though fermentation is allowed to proceed for three-fourths of the full time. The wine is then transferred to the *touels*, where it receives from 6 to 10 gallons of brandy per pipe. About two months afterwards it is drawn off into other touels, each pipe is again brandied to the extent of 6 gallons, and from 6 to 18 gallons of a compound called *jerupiga* are added.

The wine is then sent to Oporto, where the future treatment proceeds as in the first case, except that it receives there on the whole 5 instead of 3 gallons of brandy. Of the port shipped to England as "vintage wine," that is, from nine months to two years old, at least two-thirds is made in one or other of the ways just mentioned. Of the remaining third only a very small portion escapes a considerable admixture of jerupiga, yet the best sort of such adulterated wines receives not less than 25 gallons of brandy per pipe.

J. Muter, Ph.D.

(to be continued.)

[The Journal for February will contain an illustration of adulteration of port wine.]

A METROPOLITAN POULTRY MARKET.

London markets, taken as a whole, are notoriously a disgrace to the mother city, considering her enormous wealth and vast population. The Metropolitan Cattle Market is a splendid exception, and we may now fairly hope that in connection with this we shall ere long have a Metropolitan Poultry Market worthy of the name. Leadenhall Market might have done very well for the days when George the Third was king, but it is indisputably inadequate to our present requirements, and ridiculously disproportionate to the kind of market that we ought to have, and in due course of time—conjecture as to the period of its advent being hazardous, for we are very very slow in such matters,—shall have. Not to put too fine a point upon it, Leadenhall Market is *not* what it ought to be. We will not be too hard on an old friend that served our forefathers well, and whose age commands respect, though we cannot shut our eyes to the fact that the old friend aforesaid is feeble, tottering, worn-out, and utterly neglectful of his appearance. Looking at Leadenhall Market more in sorrow than in anger, turning from it with pity if not disgust, yet with a ray of hope, as there is promise of a Bill next session to improve it, and entreating our French refugee friends *not* to visit it as one of the sights of London, let us glance at the Poultry Market which is "looming in the future," as D'Israeli hath it.

The Markets Improvement Committee have long—too long, malicious people might say,—had under their consideration the best mode of utilising the vacant land on the west side of the Metropolitan Meat Market, and on the northern and southern sides of the street forming the western approach to the Holborn Viaduct; and the committee have come to the very sensible conclusion that a Poultry Market would be the best appropriation of this valuable ground. It is just because the ground is so valuable that there has been a difficulty in arriving at this conclusion, other schemes having been suggested which it has been urged would bring in more revenue. Without going into this matter it may be stated that Mr. Horace Jones, the City Architect, in a carefully prepared report, shows that a Poultry Market would be remunerative, and that it would be of immense value and importance to country and town is self-evident. Mr. Jones states that there are about 55,000 feet of land disposable, with frontages of 200 feet opposite the Meat Market and of 270 feet in Charterhouse Street; that of this space 17,000 feet might be devoted to gangways and passages,

leaving on the ground floor 38,000 feet for shops; and that the cost of the market would be 100,000*l.* There would, of course, be a large revenue from rents and tolls.

The trade carried on at the Metropolitan Poultry Market would naturally be in accordance with its name, but it is to be presumed would also include eggs, butter, etc., though what this etcetera shall comprise, and where the line is to be drawn, will be a difficult and delicate task with which the Markets Improvement Committee may be safely left to deal. One grand improvement which this scheme would gradually but certainly effect would be to turn the attention of our farmers and cottagers to the increased supply of poultry and eggs, and a probable result would be that energy and enterprise on the part of special traders, on a scale hitherto unattempted, would be brought to bear on this supply. The war has opened our eyes to a fact which we have carelessly known, but the full importance of which we have not recognised—that we chiefly depend on foreign countries for eggs, and, to a large extent, for poultry. In 1868 there were imported into England 890 millions of eggs, and this trade has since so largely increased that during the first six months only of the present year we imported about the same number, France alone sending us upwards of 600 millions. The reader who desires to know to what an extent France pays attention to poultry as food for herself and us is referred to articles in the "Food Journal" for May and August. Her unhappy condition since the outbreak of this disastrous war has produced exceptional circumstances in this as in other respects; but, ardently hoping that she will soon be able to exhibit renewed activity in sending us plenty of white meat and eggs, this should not preclude our own farmers from turning their attention to a too much neglected source of food supply.

It may be safely averred that good poultry is always scarce and dear in this country compared to what it ought to be and might be. We want a large supply and a large demand at fair profits, rather than a scanty supply, high prices, and poultry food confined almost exclusively to the upper and middle classes; and, so far as London is concerned, the continual scarcity may be partly attributed to the want of adequate market accommodation. Give us a large, handsome, and commodious Poultry Market as an adjunct to the Metropolitan Meat Market, with moderate rates and carriage, and our supply will infallibly increase. Fowls are now to a large extent kept merely for home consumption, while the only attempt at system in connection with the local markets is that the "higgler" calls periodically at the farms and takes all the young fowls fit for

market. Taking the year through, the sending dead poultry to London is the best branch of the trade. The deficiency of our own poultry supply mainly arises from a want of systematic enterprise. Many people "go in" for fancy poultry, and even for ordinary descriptions, with an eye to prizes at a poultry show. Farmers' wives and daughters have the poultry for pin-money, and hundreds of people "keep fowls," utterly ignoring the consideration that fowls might be made to keep them. But as to poultry keeping on a large scale, with an eye to meeting an ever-increasing demand, this is quite an exceptional state of things. Fowls—using the word generically—should receive attention like sheep or pigs, or even more, for they are more delicate and susceptible to diseases; but many of these are preventible and the result of bad management, or of no management at all. Very few people in the country can be ignorant of the fact that if fowls do not find any lime in the soil, or mortar from the walls, or calcareous matter in their food, they cannot lay eggs; but the poultry department of a farm is too often characterised by negligence and hap-hazard makeshifts, the fowls, for example, having only pond water impregnated with drainage to drink from, and an old tumble-down cart-house for a roosting place; whereas pure water, pure air, proper food and shelter are as necessary to them as the stock upon which so much care is very properly expended. There is no excuse for this neglect. Poultry houses may be cheaply constructed, the chief point being that they should allow for ventilation at the top without violent draughts; that they should be lined inside, say with felt, to prevent the chickens suffering in severe weather, thus affording shelter in winter and facilities for fattening in summer. But arrangements should also be made for a wide range in the pure air, with a judicious variety of food and facilities for helping themselves to it. In respect to quality as well as quantity the rearers of poultry may find scope for reform. A bad and small stock, breeding in and in, and retaining old and useless birds, are mistakes. In fact, as to fowls, ducks, geese, and turkeys, many farmers might well sweep away the miserable half-starved birds which they now keep, and take to the good laying and flesh-acquiring kinds. Properly managed, the production of poultry and eggs on a large scale would be a most profitable employment. If experience and care be brought to bear on it there need be no fear of its not paying handsomely in the long run. That the establishment of a Metropolitan Poultry Market would give an impetus to this much-needed production of food there can be no doubt, and the strict regulations which would be enforced would tend to the

removal of incidental evils which now exist in connection with our poultry supply. There is much need of reform in the methods of sending poultry to market. Geese, ducks, and fowls, alive and kicking,—if they can find room for the latter operation,—are frequently crammed into crates in which they are scarcely able to move, and are kept in a cruelly uncomfortable position by means of a bar running from end to end of their prison; and as they can thus neither eat nor drink it is thought unnecessary to supply food or water, while poultry which have evidently been miserably fed and very little cared for when alive, are, when killed, badly packed—in tea-chests, for example, or anything that comes to hand—and swathed in soft oat straw, which is heating, and consequently totally unfit for the purpose. A large special Poultry Market would remedy such errors, expand the trade, honour humanity, and ultimately materially increase the supply of poultry and eggs to the London consumer.

J. M. Philp.

The careful researches of some of our medical authorities have revealed to us a source of infectious disease of which we had but little conception. In the *British Medical Journal* Dr. Taylor, of Penrith, narrates a series of bad scarlatina cases which there appears to be little doubt were propagated entirely through the medium of milk. The disease first began in the small unventilated house of a milkman, whence it quickly travelled over the whole district of the town in which the dairy was situated, and was particularly fatal in those families which were supplied from it. From close investigations Dr. Taylor could come to no other conclusion than that the milk itself had absorbed the fever exhalations, and induced the disease in those who drank it. Again, at a very recent meeting of the Association of Medical Officers of Health, Dr. Ballard drew attention to the late outbreak of typhoid fever in Islington, which, like the scarlatina at Penrith, emanated also from a dairy. It appears on close examination that the rats had gnawed an underground tank of water which was used for the purposes of washing the cans, and *perhaps* of adulterating the milk, and that the contents had thus become contaminated with sewage from the neighbouring drains. The consequences were that the milk, which as an article of diet is largely prescribed by medical men for typhoid patients, became in itself a channel of the very worst fever poison; and that this was the case was proved by the facts that only those houses which were supplied from this dairy were attacked with typhoid, and most frequently *only the members of each family who drank the milk.* Such revelations as these are most alarming, for it would seem that the most simple and health-giving of nature's food was in danger of becoming a scourge of society instead of a blessing; and it only shows us that the sole protection that Londoners have against such dangers is to procure their milk from establishments where the whole of the arrangements are on such a large and complete scale as to reduce all such risks to a minimum. We have lately visited the Aylesbury Dairy Company's premises at Bayswater, which seem to us to fulfil all the requirements that modern science can bring to bear upon the subject; and in the face of the horrible evils which have been brought to light, we can conscientiously recommend our readers to go and satisfy themselves as to the advantages of a well-managed system of milk supply as compared with the doubtful blessings of the private dairy.

RICE.—Part II.

"Carolina Rice" is acknowledged to be the best in the world. But why? Because American climate and American river bottoms are more congenial to it than those of Egypt and of India? Probably not, but simply because its right culture has been more intelligently studied and more scientifically pursued. The American planter has done by his rice only what the English farmer has done by his turnips—made its nature and habits *his own study* instead of leaving it to the clumsy notions of labourers, or even of superintendents.

Of all American husbandries that of rice is the most picturesquely beautiful. The perfect level of the fields, dyked against encroaching tides, and intersected with canals and drains, like so many veins and arteries; the shining sheet of water by which it is first covered, succeeded in a few days by a coat of emerald green; then a mixture of overflowing water, and the green of the crop; finally, the rich-looking heads of a brilliant golden colour, drooping with a gracefulness unequalled by any other grain, are beauties which arrest the eye of the most common-place observer.

At the time of harvest the crop is cut by sickle, bound into sheaves, heaped temporarily into shocks or stooks, whence it is boated by means of the intersecting canals to the barnyard.

V. Preparation for Market.—Stacked in immense heaps in the barnyard, it is threshed at leisure, either by flails or machinery, and the grain carefully winnowed from the straw.

In this state it is known in America as "rough rice," in India as "paddy," and is now ready to be carried to the mill for "cleaning" or husking. The pearly grain is sheathed in a thin chaff, which fits it so closely and adheres so tenaciously that it can be separated only by heavy pestling, and then by being rubbed in a kind of mill. In some parts of India the process of husking is said to be facilitated by scalding or parboiling; but American machinery renders this aid unnecessary. A winnowing process, followed by one of sifting, now separates the mass into five parts—first, the chaff; next, the flour, which is a detritus of the grain and

chaff combined, and of a yellow colour; third, the small rice, which consists of fragments of grain less than half, intermixed with much of the heart or eye of the rice; fourth, the middlings, made up of all grains below prime, but larger than the small; and fifth, the prime rice of commerce.

Of these several qualities the small rice is not in general favour as an article for the table, as it contains usually an uncomfortable proportion of gravel. But it is so much sweeter than the other qualities that a lady ignorant of the process by which it is produced is said to have remarked, "I wonder why people *will* plant large rice, when small rice is so much sweeter."

VI. Its Uses.—1. As an article of food the grain is used in almost every possible form—whole, broken, half broken, coarsely crushed, reduced to powder, or dissolved. Breads of various kinds, and also cakes of delicate flavour, are made of it, combined with the flour of other cereals or used by itself. It is also prepared in the form of pilaus, pies, puddings, custards, soups, and gravies.

2. As a diet for invalids or for infants it may be pulverised in a mortar after a few minutes soaking in cold water; or it may be ground in a mill and prepared like sago, arrowroot, or tapioca; or, without pulverising, it may be made into a light nutritious gruel by boiling and straining.

3. As a medicine, in relieving a disordered condition of the stomach and bowels, it is parched brown, then boiled and eaten; or it is parched of a darker brown, drawn as coffee or tea, and used as a beverage.

4. In the laundry, where a white pearly starch is required, capable of various degrees of stiffness, it is highly valuable.

5. In the manufactures its paste is moulded into a variety of tasteful ornaments, almost as hard as porcelain.

6. Rice meal, the detritus of chaff and grain already described, is a highly nutritious and fattening food for all kinds of stock, from horses to pigs.

7. The rough rice, or paddy, is the favourite food of the rice-bird, so highly prized by epicures, and is probably the source of its peculiarly delicate flavour. It may be given to poultry with similar effect, and it contains so much silex in its rough husk that while feeding on it they need no gravel for attrition in the gizzard. It is therefore peculiarly suited for poultry on long voyages, or in places where there is no gravel in the soil.

8. The chaff is in demand for packing delicate articles of glass or china ware, and for the transportation of eggs. It is at the same time so perfect a non-conductor of heat that it is said a block of

ice properly packed in it will withstand the direct rays of a sun hot enough to open the seams of a vessel's deck.

9. The straw is manufactured into beautiful hats and bonnets and also into mats and light baskets, and, like the stalk of most other cereals, is used as a rough provender for cattle.

VII. In the Cuisine.—A lady, familiar from childhood with the luxuries of a rice plantation, furnishes by request the following instructions:—

1. To boil rice for the table à la Carolina.—First pick it free from rough grains and foreign substances; then wash it quickly in cold water, and hurry it to the pot before the grain is at all softened. As to the quantity of water to be used in boiling, there are two modes: one is to put in twice as much water as rice, and allow it all to be absorbed by the grain; the other is to put in three or four times as much water, but to pour almost all of it off as soon as the grain changes from its pearly white colour and gives proof of having softened.* In both modes, when this stage of the boiling has been attained, the pot is to be withdrawn from the hot fire and set where it will be kept at a low steaming heat until the water is all gone. This last process is called "soaking." Properly conducted the rice comes from the pot perfectly done, of a clear white, with each grain *firm* and *distinct*, and swelled to double its original size. Salt of course is to be added. Rice prepared in this way should *not be stirred* much in boiling or it will become gluey; a large open fork passed through it once or twice will be sufficient.

2. Rice pie.—Chief ingredients: a pint of rice and a fat tender fowl.—First boil the fowl in water enough to cook the rice, according to the rule just given. When the fowl is done take out the larger bones and cut it into small pieces. Spread a layer of the cooked rice on the bottom of a deep pan, and on it place a layer of the fowl, with butter and eggs mixed, and with black pepper and spices to suit. Alternate these layers until the pan is full, having a layer of rice at top, on which pour a mixture of butter and egg, and set the whole to "browning" in an oven or on the fire; then serve it at table in the vessel in which it is last cooked. This dish somewhat resembles in richness the celebrated pilua of the Turks.

J. H. Lamprey.

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* It is at this stage, the water being poured off, that it is sometimes prepared for invalids by pouring in milk and boiling with sugar, spices, or other flavours to suit the case.

FOOD IN BESIEGED PARIS.

[By Balloon Post.—Dec. 15.]

Generals Trochu, Ducrot, and Vinoy, and two Admirals, have pushed back the enemy and quieted the outer forts, which have now no marks to aim at; but General Famine marches on with grim visage and rapid strides. We are not near starvation, nor are we likely to be, but we are far from revelling in the lap of luxury or over indulgence, unless it be in tea, coffee, and chocolate, wine and spirits. Of these and bread we have plenty, and there the list ends.

Of all the words in the dictionary that which terrifies us most is *requisition*. It means providence, regulation, and equality of supply, but it sounds to the ear like deprivation. That which is actually called up by the Government is only available in atomic quantities; consequently requisition means unmistakeably great scarcity, if not an approaching exhaustion.

As is known, if my former balloon letters have reached London, flour, wheat, and cattle have long been placed under requisition. Horse, mule, and ass flesh have been included with other meat. With respect to horses, mules, and asses, a census was taken at the end of last month. None of these animals could from that time be killed or sold without notice being given, and any animal not declared and afterwards discovered became forfeited to the State. Requisition was also made of cows, but the importance of milk to children and invalids rendered special arrangements necessary; and all who declared their cows, and proved that they possessed the necessary food for them, are allowed to keep but not to part with them. After the date of the expiration of the notice strict enquiry was made, and 1720 cows were declared to be forfeited to the State. The order was, however, so far relaxed that the owners were paid for them at the market price for killing. The total was made up as follows:—954 declared after the day appointed, 350 not declared at all, and—416 for whom sufficient provender was not assured. After the seizure of all these there remained 4,217 milch cows in Paris, so that an actual failure in the supply of milk is not imminent. At the same time we are paying double the usual price. The milk is reduced to the extent of 40 and 50 or more per cent., and it is quite by favour or by luck that we obtain any at all. When I say that

one of the small tins of the condensed milk of either the Anglo-Swiss or the English Condensed Milk Companies is worth at least 5*s*., the whole facts of the case are made manifest.

Bones have fallen under requisition. The bones of all animals killed for food are required to be delivered up at the rate of 1*s*. per cwt. In the requisition it is stated that the Academy of Science has declared, as the result of many experiments, that it appears to be established that bones may be made to yield nutritive preparations. In general, bones which are worth in commerce 10*d*. per cwt. at the utmost, are only employed for the extraction of common grease, and being destroyed by acids are afterwards thrown into the sewers. The Government therefore issues a requisition for all bones not sold with the meat to customers, or employed in making soup, at the price of 1*s*. per cwt.

There has been an outcry raised against the pork-butchers, who were said to have smuggled away all the pork and other viands that they possibly could, and to have converted them into potted meats, galantine, pâtés, sausages, etc., which they sold to the wealthy at enormous prices. That they did this to some extent is no doubt true, for such preparations are to be found even yet, at rates which might have caused even a Lucullus to hesitate. Little tins of *foies gras*, about the size of an old-fashioned snuff-box, are marked from 4 to 8 francs, and the smallest pâté is worth nearly the same money. A truffled turkey at the present moment would certainly be sold for 5*l*. at least. A fine one filled with the truffles is worth about 40 francs at ordinary times. To give an idea of the prices of pork-butchers' delicacies, I may mention that Lyons sausage is worth about 10*s*. a pound, or three times the usual price. To meet this state of things a requisition has been issued, and declaration required to be made of all kinds of salt pork, ham, etc., and preparations of *charcuterie* of all kinds whatsoever, the prices to be fixed by two arbitrators. I doubt if this act has been put in force, for the quantity has been so small as not to afford a day's consumption for the mass, while the withdrawal of all delicacies from the market would cause great offence to the small class to which they have become almost necessaries; for if the Government should take these preparations in hand, it must ration them out as it does butchers' meat and other food, and nobody would, in fact, be any better if it were so.

In the distribution of meat it has been found that nothing could possibly be so bad as to have this undertaken by the authorities, no matter of what class. The confusion, the loss of time, the injury to health by standing for hours exposed to the

cold morning or night air, the ill-will and disagreements that grew out of the arrangement, are inconceivable. In many if not all of the districts the business has been placed again in the hands of the butchers and proceeds with regularity. Unfortunately, however, there is little fresh meat to be sold now, but the butchers have become salesmen of fresh and salt beef, horse, etc., and also of fish, cheese, potatoes, or anything else which exists in quantities sufficient for general distribution. In my *arrondissement* each family has the right to *something* about every four days. The ration of meat is now reduced to 40 grammes each person daily, so that a family of five gets a piece of meat weighing less than 2 lbs. for four days' consumption. On some days salt cod of a very poor kind is substituted for meat, and a family with which we are acquainted in another *arrondissement* has upon two occasions obtained splendid rations of Dutch herrings—five at first and three afterwards! Cheese and potatoes are additional, but I can say little about them, seeing that our butcher has never been supplied with that kind of food. I *can* say, however, that a peck of potatoes was worth about 8*s*. the last time that we tasted that vegetable, and moreover that the small stock of desiccated potatoes, which were not at all bad, is exhausted.

I cannot forbear giving an example of the ideas of the *commune* party as a fine instance of liberty, equality, and fraternity. *Citoyen* Rocher, captain of the 63rd battalion of the National Guard, is a great *commune* hero, and particularly hard upon those who make stores of provisions. He scented a little pig in the house of *citoyenne* Jacogne, and bursting into the house with three of his men, demanded half of the carcass. The poor woman declared that it was all she had; that her husband had brought it into Paris with him; that she had several children, and the pig was very small and very thin. She implored the captain to accept a pound or two, but not to ask for more. He would have nothing less than half. A disturbance arose, the neighbours interfered, and the bold Bobadil was put to flight. Of course, the husband of the woman soon heard of the occurrence and wrote a furious letter to M. Blanqui's journal *La Patrie en Danger*, when it came out that both parties were ardent members of the *commune!* That is no reason, it may be said, why Bobadil should demand half the other's pig, and that was precisely the opinion of *citoyen* Jacogne. But then where was the fraternity?

As regards my personal experience of the rationment I cannot say much. We had half a leg of mutton about three weeks ago, and we have had a bit of salt beef and a bit of horse beef since;

but the saddest day which we have passed was that on which *the last bit of English ham disappeared!* Fortunately we are promised some fresh beef next week.

The stock of horses is becoming a subject of intense interest. When the enemy arrived we had more than 100,000 within the limits of Paris. We have eaten upwards of 30,000 of them, and allowing a reserve of 20,000 for the army and half as many for general purposes, we have about as many more to consume. This should supply some 10,000 tons of meat, or sufficient for three months. But then we are told that horse beef is one-sixth more nutritious than ox beef.

Some gastronomical philosophers of the Acclimatisation Society have been banquetting on all the extraordinary viands which they could collect, and *salmi* of rat and broiled dog's liver are declared by them to be exquisite, while the young rats which furnished the garnish to a roast cat were admitted to be uneatable, and a dog's hind-leg was pronounced as tough and stringy as it is proverbially crooked.

In spite of the talk about cat and dog eating, I must confess I was sceptical until very lately. The other day, however, some of each was eaten next door to us and pronounced excellent, and on the same day—it never rains but it pours—I had the fortune to make the acquaintance of a dog butcher. He had a small covered cart with this inscription painted in immense letters on each side: "*Résistance à outrance. Boucherie canine et feline.*" At the back of the van was the following:—"*Héroique Paris brave les Prussiens; quand il a mangé sa viande chevaline, ses chiens, ses rats et ses chats.*" The proprietor kindly exhibited to a curious crowd four dogs very nicely got up, and when asked whether they were good he answered, "Good! I should think so; why, they are the saving of many invalid ladies' lives!" It is evident, however, that Paris does not take kindly to cat and dog. This, or another butcher of the same class, had his cart attacked the other day, and five live dogs escaped from it in the *melée*. The bother ended in the parties being taken before the Commissaire of Police, who recommended the man to abstain from such announcements in future, because they tended to cause disturbance.

Horse flesh causes very little repugnance, and after the engagements the other day outside Paris the soldiers had grand feasts of horse meat. The whole of the horses killed were prepared properly and cooked, slaughterers being sent out for the purpose.

It would be unfair not to say a few words respecting the service done to the people of Paris by the *Extractum Carnis*. I and some of my

friends have made large use of Tooths' preparation and the various others, and we have found them excellent. There is little, if any, of the English extracts left in stock now. A French company, having adopted the absurd title, "Of Meat," which pronounced in French "*Of méá*" becomes exceedingly ludicrous to English ears, has pushed its extract with great assiduity for some time, and tells the world that the extract made by the Of Meat Company is infinitely superior to that prepared on Liebig's plan. It had a considerable stock at the commencement of the siege, but its retail establishment is almost empty now. An Italian company has lately made its appearance with an extract which is also *Liebig perfectionné*, and as it makes a good show it will not want for customers.

The feeding of the poor is indeed a serious matter under the circumstances in which we are placed, and the Government has set aside an additional sum equal to 20,000*l.* for the establishment of new economic kitchens for the supply of the indigent. It has allowed 7½*d.* a day to the wives of all the men in the National Guard who may apply for it, in addition to the pay of 15*d.* to the men themselves. Now that the thermometer is several degrees below freezing, and the ground is covered with snow, all the aid that public and private charity can supply is, as may be supposed, fully required.

One grand point is that bread is plentiful, and bestowed where required with a liberal hand. The mills set up by the Government are working admirably, and the flour produced, though not of the usual whiteness of the best Paris make, is excellent. Some people complain that the bread is coarse, but in reality it is better than usual, there being no potatoes in it. With a view to meet this complaint of the colour of the bread a Committee of the Central Hygienic Commission, consisting of MM. Bouchurtat, Sainte Claire Deville, Trélat, G. See, Ad. Wurtz, De Montmahon, H. Baillon, Cubeer, Chauveau-Lagare, Reynal, Onimus, Du Mesnil, Béhier, and Gavarret, have issued the following note:—"Making bread of flour completely deprived of every particle of bran, as is usual in Paris, takes away from the bread a notable portion of its alimentary principles, and causes a regrettable loss. Taking this into consideration, the Commission reminds the public that brown bread, far from being injurious as many people imagine, is more wholesome and more nourishing than white bread." It should be added that the bread produced here at present is not actually brown bread, but only brownish.

G. W. Yapp.

THE COFFEE DUTY.

IT is fully admitted that the consumption of coffee is gradually falling off in England, and I venture to point out what a disadvantageous position it occupies in comparison with that of tea. Whereas—as Mr. Crawford stated with perfect correctness in the debate on the Budget in the House of Commons—in the purchase of tea a highly manufactured article was bought which might at once be consumed, in the case of coffee the article was bought in a raw state, and had to go through a considerable amount of preparation before being brought into use.

Take the case of coffee, at 80*s.* per cwt., this would be per lb...	8·57*d.*
Duty at 3*d.* per lb.	3*d.*
Roasting, at 3*s.* per cwt., would be per lb.	0·32*d.*
	11·89*d.*

112 lbs. raw coffee, at 11·89*d.* per lb., = 5*l.* 10*s.* $11\frac{48}{100}$*d.*
As a cwt. of raw coffee produces only, upon an average, 92 lbs. when roasted, the cost per pound after roasting would be equal to .. .. 14·47*d.*
The first cost having been .. .. 8·57*d.*

The difference arrived at is .. .. .. 5·90*d.*

An advance of 5·90*d.* upon 8·57*d.* would be 68·84 per cent.

Coffee would therefore cost the consumer, in consequence of the duty being imposed upon it when raw, 68·84 per cent. advance, upon an average, on the first cost in bond; and it therefore follows that the grower of coffee is placed at a disadvantage with the grower of tea to the extent of the loss and charge attending the roasting of his produce; and that consequently if it be desirable that these two articles should be subject to equal burdens, the grower of coffee has a claim for relief to the extent indicated. It is to be hoped that the Chancellor of the Exchequer may see fit to take these facts into favourable consideration. I may add that cocoa has for a considerable period only paid 1*d.* per lb. duty. Sago-flour and other untaxed compounds to increase its consistency are added, and the article is sold retail at about 6*d.* per pound.

The coffee grower would, however, be at once relieved to some extent, and the consumer also much benefited, by an alteration in the existing law which regulates the retail sale of chicory. At present, I believe, permission is accorded to retail grocers to

packets to the public labelled coffee and chicory; and this procedure practically extends official sanction to the adulteration of the former to the loss of *all* concerned, save the dishonest retailer whose illegitimate gains are thereby very large. As has been observed by a correspondent of great experience, let retail grocers sell coffee and chicory separately, and mix them under the eye of the customers, if so desired. The increased duty on chicory is of no avail, because this article becomes then, in turn, the subject for fraud. If the Chancellor of the Exchequer would reduce the present duty on coffee from 3*d.* to 1*d.* per pound (the total amount of the existing duty is under 400,000*l.*), and an alteration be made in the law as to the retail sale of chicory, a great and early increase in the consumption of *genuine* coffee might reasonably be expected, which would most probably supply the temporary loss to the revenue involved in the reduction of duty; while to the poorer classes the boon would be invaluable, as they would *then* be able to drink one of the most exhilarating and strengthening of beverages, which would prove a very powerful rival to the poisonous dram and well drugged beer.

A reduction of duty would also be of the greatest value to our possessions in the East and West Indies. One of the most prosperous of our colonies, Ceylon, by the indomitable energy and perseverance of her planters, aided by the liberal action of the Imperial and Local Governments, has become—I allude especially to the interior of the island—a splendid and extensive coffee garden. Should, however, unfortunately, the consumption of coffee continue to fall off, and coffee planting cease to be remunerative, the condition of that magnificent island now so flourishing would rapidly retrograde, financially and otherwise.

Having passed the best portion of my life in the public service of Ceylon, and latterly being in civil charge of the Central Province, in which the greater portion of the coffee plantations are situated, and having afforded from time to time all the official aid in my power, as the chief executive authority of the province and a member of the Island Legislature, to measures calculated to develop its resources, I am naturally sincerely desirous of seeing the prosperity of the colony continued and extended, the more particularly when such prosperity must be considered to be in strict accordance with, and not in antagonism to, the best interests of the mother country.

E. Rawdon Power.

DOMESTIC RECIPES.

The Editor desires to appeal to his readers, and especially to the ladies, for contributions of recipes for cheap, tasty, and serviceable dishes, both for poor households and those of the higher classes.

POOR MAN'S SOUP FOR COLD WEATHER.

Take 3 pints of peas, soaked in the well all night; put them into 3 quarts of water and stew them for five hours. Chop up very small 5 lbs. of onions, leeks, celery, turnips, and carrots; stir them in a saucepan over a stove with ½ lb. of fat for ten minutes; add 1 lb. of oatmeal, and stir again for five minutes more, and finally stew for an hour with 20 quarts of broth from boiled beef, not over-salted.

BAKED ORANGE MARMALADE PUDDING.

Take 2 tablespoonfuls of orange marmalade, 3 oz. of butter slightly melted before the fire, and 1 oz. of powdered loaf sugar; mix and beat them together in a marble mortar. Add the yolks and whites of five eggs beaten separately. Beat up and place the mixture in a pie-dish, and bake without delay in a moderately brisk oven for three-quarters of an hour. B.M.

TO MAKE SAUSAGES.

Take an almost double weight of fat to your lean pork, and pick both clean from the bones and skin; shred them together very fine, and to 4 lbs. of this meat add a large nutmeg, the weight of it in cloves and mace, and the weight of almost all the spice in pepper. Beat it all fine, and let your heap of salt be as large again as the spice and pepper. Shred a large handful of fresh sage and a little thyme very fine; grate two spoonfuls of white bread, and take the yolks of two eggs. Mix all well together, and fill the skins with the meat.

MOCK TURTLE SOUP.

Take a calf's head scalded, two pairs of goose giblets, 2 or 3 lbs. of eels with the bones taken out, one rabbit, 1 lb. of lean tripe, parsley and other herbs, two bottles of Madeira, a bag of spice, containing long, common, and Jamaica pepper and cloves. The soup must be made of 4 or 5 lbs. of beef or veal.

AN EXCELLENT PLUM-PUDDING.—*(From an old M.S.)*

Take 1 lb. of suet; shred it very small and sift it; add 1 lb. of raisins stoned, four spoonfuls of flour, four ditto of sugar, and five yolks and three whites of eggs. Beat the eggs with a little salt, tie the whole up closely, and boil it for at least four hours.

A DISH OF PIGS' FEET AND EARS.

Make the pickle with bran and salt boiled in water, and let it be a pretty strong pickle. When it is cold lay the feet and ears in, and let them remain for a week or ten days. They may be kept longer, but the liquor must then be changed. When they are to be used, shred the ears pretty small and toss them in a good gravy, thickened with burnt butter and seasoned to taste. The feet should be split and broiled, having been first dipped in the yolk of an egg, rolled in grated bread, and then laid round the dish.

NOTES OF THE MONTH.

The usual Saturnalia of fat beasts, the Smithfield Cattle Show, has been held as usual at the Agricultural Hall in Islington with very great success, although the feeling of satisfaction at seeing so much plenty was considerably damped by the thought of the slow starvation which our brethren across the Channel are suffering. There were the usual overfed pigs gazing at the bystanders (when their fat would allow them to see) with an expression which plainly said, "Oh! that this too solid flesh would melt." It was generally remarked about the cattle that they exhibited an uniform standard of feeding which had never been reached before, and which proves that our farmers have succeeded in reducing stock fattening to a science.

At a late meeting of the Society of Arts, Lord Vernon in the chair, Mr. H. M. Jenkins, the Secretary of the Royal Agricultural Society, read a very interesting paper on the co-operative cheese factory system, the further introduction of which into this country he strongly advocated. It is a healthy sign that movements which have for their object the increase of our food resources in proportion to our increasing population are receiving some of that attention which ought to have been given to them long ago; and we earnestly trust that such an important item in our farming economy as the improved manufacture of cheese will not be allowed to drop from want of support on the part of the landowners, or from prejudice on the part of the farmers.

We have lately seen and partaken of an importation of meat sent over from Melbourne by the Victoria Meat Preserving Company of that colony to their offices in London. It was by far the most satisfactory experiment that has been brought before us of meats, not packed in tins, but in bulk covered by their own fat, which hitherto have been offered to the consumers in an eatable though not in an appetising form. The meats of the Victoria Company, which consisted of cold boiled beef, rolled mutton, hot pasty, tongues, etc., were very little different from fresh English samples; and we feel assured that if the consumer could rely on being furnished with joints such as these at about 6½*d.* or 7*d.* per lb. without bone, the prejudice against Australian meat would be very materially lessened.

Mr. J. M. Maisch, in the *Chemist and Druggist*, calls attention to the adulteration of saffron by prepared chalk, treated with glucose or honey to increase its pollen-like appearance. The proportion of the adulterating ingredient is estimated at about 10 per cent. of the entire weight. Saffron consists of the dried stigmas of the *Crocus sativus*, and has the properties, when taken in large quantities, of producing great mirth and laughter; so much so that the Latins had a proverb, "*Dormivit in sacco croci*" (He hath slept in a saffron bag), to denote a merry temper. As saffron is frequently used in medicine and cookery its adulteration is a matter of some importance.

We are glad to perceive that Mr. Liddle, the Medical Officer of the Whitechapel Union, still continues his crusade against the nefarious dens that do duty for dwellings in that locality; and we cannot help feeling it a reproach to our authorities that it should be left so much to one energetic man to point out and make head against so monstrous an evil. In common with other medical officers of our populous towns, Mr. Liddle deprecates the system of tinkering that prevails, and is of opinion that nothing but the wholesale pulling down of these miserable blocks of buildings will be of the slightest use. Our sanitary Acts are terribly defective, and although we have been promised over and over again that the whole subject should be thoroughly dealt with, nothing has yet been done that goes to the root of the evil. How long will our rulers shut their eyes to the irremediable mischief that, like leaven, daily increases amongst us, and will ere long burst its boundaries, and overflow all ranks of civilised society? A heavy retribution will some day be exacted of us, and we shall well deserve it; for in defiance of warning voices like those of Mr. Liddle, and Dr. Trench of Liverpool, we are still utterly careless on some of the most important questions of the day, viz., the national health and morality.

The subject of lead poisoning by the domestic use of lead pipes for water appears to be one of considerable interest in the New World as well as the Old, and the *Boston Journal of Chemistry* calls attention to the tin-lined pipes which have come into use there, and against which it emphatically warns its readers: 1st, because tin by itself is often more readily attacked and dissolved by water than is lead; and 2nd, that when placed in association with lead, if any water contact is made between the tin and lead, both metals are dissolved with increased rapidity. Galvanised iron pipe is just as dangerous, for in this case salts of zinc are formed and gradually dissolved.

A lard case was lately tried at Liverpool which throws some interesting light on the tricks of that trade. The plaintiff sought to recover from the defendant the price of a certain quantity of lard which the latter had bought, but had returned as being unfit for food. Mr. Whitthread, an analytical chemist, proved that some of the bladders which he had analysed contained a mixture of lard, mutton fat, rape oil, and water, the latter in the handsome proportion of 19 per cent. It appears that American lard, which is of a soft quality, is frequently sold instead of English, which is much harder, and that it requires a considerable amount of manipulation to bring it up to the standard of the latter; and to do this pressed lard and water are frequently added in large quantities. The verdict of the Court was that the plaintiff be required to take back his fraudulent stuff without payment for it. Two hundred years ago he would have had to face his Liverpool customers in the pillory.

The busy manufacturing town of Blackburn, which is in general remarkable for the public spirit of its inhabitants, has been showing the black side of its social condition of late, inasmuch as its death-rate, which is usually 26 per 1,000, has run up to 36 and 38. It appears that the water of the town has been found on analysis to contain 10·40 grains of solid residue per gallon, while infusorial life was five times as great as in the water supplied to the Manchester people from their reservoirs in the Yorkshire hills. Infantile life, too, is in a bad plight at Blackburn, owing to the terrible habit prevalent in our factory towns of mothers sending their little ones to the care of professional day nurses while they are at work. There is no finer opening for a philanthropist to be found in our manufacturing districts than in the establishment of *crèches*, which, in our opinion, ought to be made a compulsory measure under the supervision of the Local Boards of Health.

OUR EXPERIMENTAL COLUMN.

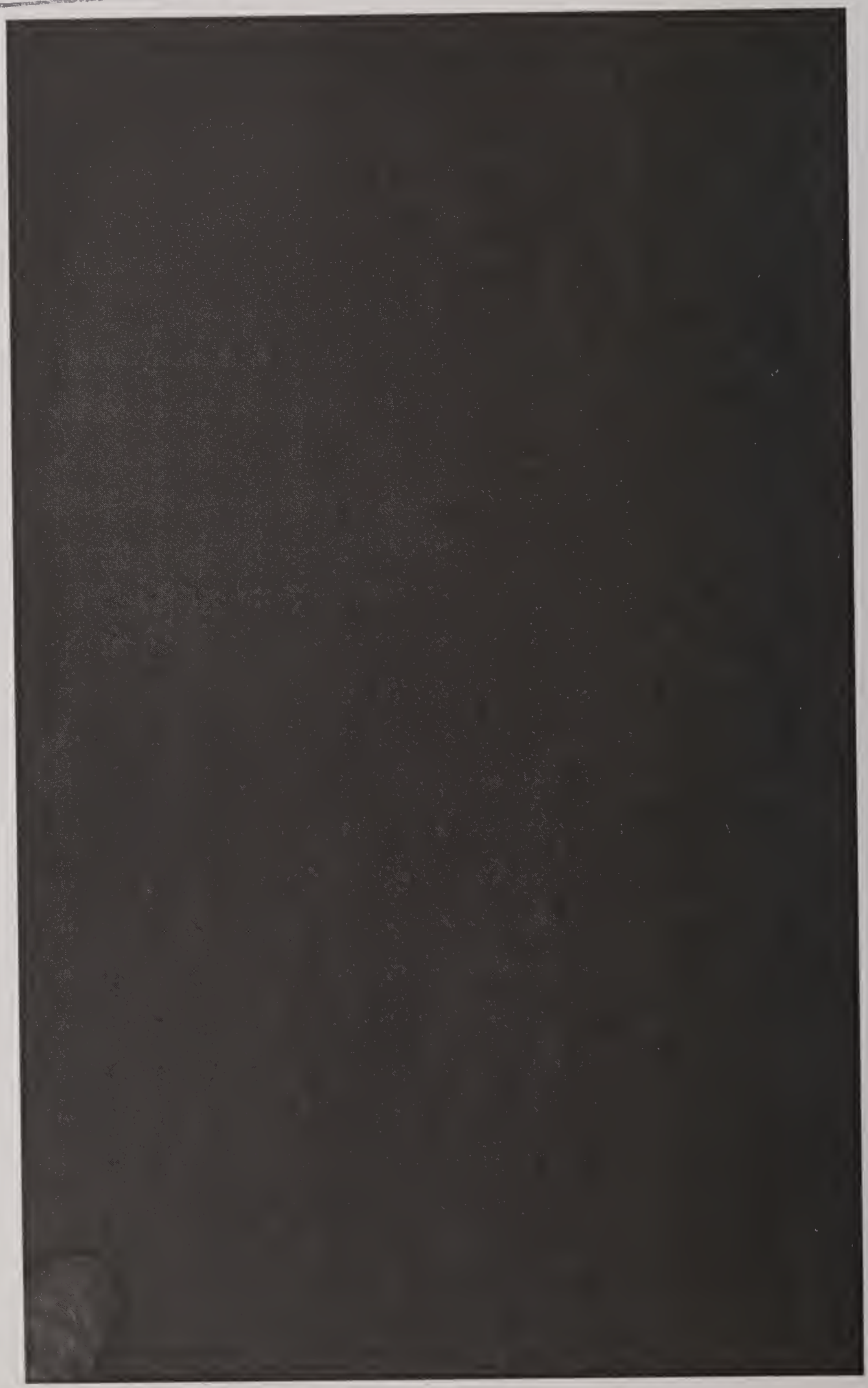
Batty's Patent Herbaceous, Granulated, Vegetable Pea Soup.—In pity to the purchaser Mr. Batty ought to remember that "brevity is the soul of wit," just as a condensed form of soup is supposed to be the essence of everything that is good. However, apart from its long name, this preparation makes an excellent dish of soup, and though we cannot conscientiously say that we detected in it the flavour of every ingredient named, we finished our portion without being aware that it was only intended as a substitute for ordinary pea soup. Having said this much we need scarcely observe that for travellers, sailors, or soldiers it is a most valuable article.

NOTICES OF BOOKS.

"Cookery for the Times," by B. M., deserves, we think, more attention than the ordinary run of culinary books, for it is clearly the work of one who has felt the difficulty that prevails among housekeepers in inducing their cooks to study the directions given them. To the uninitiated a cookery book generally seems as great a puzzle as the Pharmacopœia, but in the present case we are bound to say that the arrangement seems particularly clear; for instance, in the case of a goose all the necessary condiments and adjuncts will be found described under that one heading, so that if the cook can or will read at all, no chance is run of any possible catastrophe, such as is sometimes announced by Mary at dinner time: "Please 'm, cook's bin and forgot the stuffing." Another feature of the work is that it can be bought either in one volume or in seven different parts, which can be hung up in a frame in the kitchen, and consulted independently of each other. The recipes appear to be the results of personal experience; and altogether we can safely recommend "Cookery for the Times" to our lady readers.

"The Home Nurse," by Miss Le Hardy, is charmingly clear and sensible, and ought to be in the home library of every household. Few are there, alas, which have not many opportunities of nursing thrust upon some of its members; and even with their multitudinous experiences in this branch of domestic duty, how few people there are who know the proper way of performing little necessary invalid attentions at the right time and in the right place. Only those who have been invalids can tell the priceless comfort of being tended by skilful hands as well as loving ones; and *au contraire*, we all remember the intense misery inflicted by Betsy Prig on her sick patient, whose hair she fiercely brushed up the wrong way, ending by a spiteful twist into his eyes. These little points, as well as more important ones, are not neglected by Miss Le Hardy, who indeed shows a pardonable weakness for our vanities, for she says, "After the operation of shaving is performed by or for the sick man, be in no hurry to remove the looking glass, but give him the satisfaction of indulging in another comb of the whiskers or curl of the moustache." We hope that our home nurses will not disdain to be further instructed by this valuable little volume.

BOOKS RECEIVED.

"The Coffee Planter of Ceylon." By W. Sabonadière. E. & F. N. Spon.
"Manual of Diet." By Duncan Turner, L.R.C.P. Churchill & Sons.

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